Service Manual
CU515/TU515

Model : CU515/TU515

Table Of Contents

1. INTRODUCTION

1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of this model.

1.2 Regulatory Information

A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. System users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. The manufacturer does not warrant that this product is immune from the above case but will prevent unauthorized use of commoncarrier telecommunication service of facilities accessed through or connected to it. The manufacturer will not be responsible for any charges that resultfrom such unauthorized use.

B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the phones or compatibility with the net work, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

D. Maintenance Limitations

Maintenance limitations on the phones must be performed only by the manufacturer or its authorized agent. The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

1. INTRODUCTION

E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

G. Interference and Attenuation

A phone may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

H. Electrostatic Sensitive Devices

ATTENTION

Boards, which contain Electrostatic Sensitive Device (ESD), are indicated by the ⚠ sign. Following information is ESD handling:

- Service personnel should ground themselves by using a wrist strap when exchange system boards.
- When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded.
- Use a suitable, grounded soldering iron.
- Keep sensitive parts in these protective packages until these are used.
- When returning system boards or parts like EEPROM to the factory, use the protective package as described.

2. PERFORMANCE

2. PERFORMANCE

2.1 System Specification

Item	Type / Spec.
1.Type	TFT Main_LCD & Mono Sub LCD Folder
2.Size	96 x 49.5 x 18.3 mm
3.Weight	100.5g, (With 1,000mA Battery)
4.Battery	Standard :1,000 mAh (Li-ion)
5.LCD Type	TFT Main LCD(2', 176 x 220), Mono Sub LCD(1.3' 128 X160)
6.Accessory 1)Travel Adaptor 2)Ear-Mic Adaptor 3)Data Cable	 1) Input : AC 100~240V , Output : 5.1V, 700mA 2) ELA 3) USB data cable (option)

2.2 Using Condition (Accessory)

1) Maximum Using Condition (Using Environment)

Item	Specification
Available AC Input Power	AC : 240 V Max
Available DC Input Power	DC : 12 V Max
Storage Temperature	- 20 ~ + 70 °C

2. PERFORMANCE

2) General Using Condition

Item	Spec.	Min	Typ.	Max	Unit
Output Power	DC Power			12	Vdc
	Battery Power	3.2	3.7	4.2	Vdc
Input Power	AC Power	100	110	240	Vac
Current Consumption					W
Operation Temperature		-20		60	°C

2.3 Radio Performance

1) Transmitter-GSM Mode

Item	Specification
Phase Error	Rms : 5° Peak : 20°
Frequency Error	GSM : 0.1 ppm DCS/PCS : 0.1 ppm
EMC(Radiated Spurious Emission Disturbance)	GSM/DCS : < -28dBm
Transmitter Output power and Burst Timing	GSM : 5dBm - 33dBm ± 3dB DCS/PCS : 0dBm - 30dBm ± 3dB
Burst Timing	<3.69us
Spectrum due to modulation out to less than 1800kHz offset	200kHz : -36dBm 600kHz : -51dBm/-56dBm
Spectrum due to modulation out to larger than 1800kHz offset to the edge of the transmit band	GSM : 1800-3000kHz :< -63dBc(-46dBm) 3000kHz-6000kHz : <-65dBc(-46dBm) 6000kHz < : < -71dBc(-46dBm) DCS : 1800-3000kHz :< -65dBc(-51dBm) 6000kHz < : < -73dBc(-51dBm)
Spectrum due to switching transient	400kHz : -19dBm/-22dBm(5/0), -23dBm 600kHz : -21dBm/-24dBm(5/0), -26dBm
Reference Sensitivity - TCH/FS	Class II(RBER) : -105dBm(2.439%)
Usable receiver input level range	0.012(-15 - -40dBm)
Intermodulation rejection - Speech channels	± 800kHz, ± 1600kHz : -98dBm/-96dBm (2.439%)
AM Suppression -GSM : -31dBm - DCS : -29dBm	-98dBm/-96dBm (2.439%)
Timing Advance	± 0.5T

2)Transmitter - WCDMA Mode

Item	Specification
Transmit Frequency	WCDMA850 : 824 MHz ~ 849 MHz
	WCDMA1900 : 1850 ~1910 MHz
Maximum Output Power	+24 dBm / 3.84 MHz, +1 / -3 dB
Frequency Error	within ±0.1 PPM
Open Loop Power Control	Normal Conditions : within ±9 dB,
	Extreme Conditions : within ±12 dB
Minimum Transmit Power	< -50 dBm /3.84 MHz
Occupied Bandwidth	< 5 MHz at 3.84 Mcps (99% of power)
Adjacent Channel	> 33 dB @ ±5 MHz,
Leakage Power Ratio (ACLR)	> 43 dB @ ±10 MHz
Spurious Emissions $\lvert f\text{-}f_c\rvert$ > 12.5 MHz	< -36 dBm / 1 kHz RW @ 9 kHz ≤ < 150 kHz
	< -36 dBm / 10 kHz RW @ 150 KHz ≤ f < 30 MHz
	< -36 dBm / 100 kHz RW @ 30 MHz ≤ f < 1 GHz
	< -30 dBm / 1 MHz RW @ 1 GHz ≤ f < 12.75 GHz
	< -41 dBm / 300 kHz RW @ 1893.5 MHz < f < 1919.6 MHz
	< -67 dBm / 100 kHz RW @ 925 MHz ≤ f ≤ 935 MHz
	< -79 dBm / 100 kHz RW @ 935 MHz < f ≤ 960 GHz
	< -71 dBm / 100 kHz RW @ 1805 MHz ≤ f ≤ 1880 MHz
Transmit Intermodulation	< -31 dBc @ 5 MHz & < -41 dBc @ 10 MHz
	when Interference CW Signal Level = -40 dBc
Error Vector Magnitude	< 17.5 %, when Pout ≥ -20 dBm
Peak Code Domain Error	< -15 dB at Pout ≥ -20 dBm

2. PERFORMANCE

3)Receiver - WCDMA Mode

Item	Specification
Receive Frequency	WCDMA850 : 849 MHz ~ 894 MHz
	WCDMA1900 : 1930 ~1990 MHz
Reference Sensitivity Level	BER < 0.001 when $\hat{I}_{or}$ = -106.7 dBm / 3.84 MHz
Maximum Input Level	BER < 0.001 when $\hat{I}_{or}$ = -25 dBm / 3.84 MHz
Adjacent Channel Selectivity (ACS)	ACS > 33 dB where BER < 0.001 when $\hat{I}_{or}$ = -92.7 dBm / 3.84 MHz
	& I_{oac} = -52 dBm / 3.84 MHz @ ±5 MHz
Blocking Characteristic	BER < 0.001 when $\hat{I}_{or}$ = -103.7 dBm / 3.84 MHz
	& $I_{blocking}$ = -56 dBm / 3.84 MHz @ Fuw(offset) = ±10 MHz
	or $I_{blocking}$ = -44 dBm / 3.84 MHz @ Fuw(offset) = ±15 MHz
Spurious Response	BER < 0.001 when $\hat{I}_{or}$ = -103.7 dBm / 3.84 MHz & $I_{blocking}$ = -44 dBm
Intermodulation	BER < 0.001 when $\hat{I}_{or}$= -103.7 dBm / 3.84 MHz
	& I_{ouw1} = -46 dBm @ F_{uw1}(offset) = 10 MHz
	& I_{ouw2} = -46 dBm / 3.84 MHz @ F_{uw2}(offset) = ±20 MHz
Spurious Emissions	< -57 dBm / 100 kHz BW @ 9 kHz ≤ f < 1 GHz
	< -47 dBm / 1 MHz BW @ 1 GHz ≤ f ≤ 12.75 GHz

2.4 Current Consumption

	WCDMA Only	GSM Only
Sleep Mode	1.5mA(sleep current) ↓	1.5mA(sleep current) ↓
Standby	4mA(DRX=1.28sec) ↓	4mA(MF=5) ↓
Talk Mode	VC 13dBm (low power mode) : 300 mA↓	310 (Tx Lvl:5) ↓
NO SVC Mode	TBD	TBD
Power Off (Backup Battery Charging)	300μA ↓ 500μA ↓	300μA ↓ 500μA ↓

2.5 Operation Time

	Stand by	Voice Call	VT
WCDMA Only	333 hours ↑ = 3mA ↓ (1000mAh battery, DRX cycle = 1.28)	180 mins ↑ = 300mA (1000mAh battery, TX = 13dBm)	/
GSM Only	333 hours ↑ = 3mA ↓ (1000mAh battery, Paging frame class5)	190 mins ↑ = 310mA ↓ (1000mAh battery, TX = Level 5)	/

2.6 RSSI Bar

Level Change	WCDMA	GSM
1) BAR 5	-90 ± 2 dBm	-87 ± 2 dBm
2) BAR 5 → 4	-90 ± 2 dBm	-87 ± 2 dBm
3) BAR 4 → 3	-95 ± 2 dBm	-92 ± 2 dBm
4) BAR 3 → 2	-100 ± 2 dBm	-97 ± 2 dBm
5) BAR 2 → 1	-103 ± 2 dBm	-102 ± 2 dBm
6) BAR 1 →0	-106 ± 2 dBm	-107 ± 2 dBm

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2.7 Battery Bar

Indication	Standby
Bar3	3.76 ± 0.05V
Bar 3 → 2	3.76 ± 0.05V
Bar 2 → 1	3.687 ± 0.05V
Bar 1 → Empty	3.617 ± 0.05V
Low Voltage, Warning message+ Blinking	3.493 ± 0.05V (Stand-by) / 3.617 ± 0.05V (Talk) [Interval : 3min(Stand-by) / 1min(Talk)]
Power Off	3.28 ± 0.05V

2.8 BACKUP BATTERY : Over 50 hours (When Normal POWER OFF/EMERGENCY OFF)

2.9 Sound Level

Key Tone

1) Standby :

a) Speaker : 70~120dBspl (When 30cm distance, Maximum Tone)

b) Headset : 70~100dBspl

c) Warning Tone : 70~120dBspl (When 30cm distance, Maximum Tone)

2) Talk :

a) Speaker : 70 ~ 100dBspl

b) Headset : 70 ~ 100dBspl (Key Tone(In Calling) 100dBspl under)

c) Warning Tone : 70~100dBspl (When 30cm distance, Maximum Tone)

3. TECHNICAL BRIEF

3.1 General Description

The CU515 supports UMTS-850, UMTS-1900, GSM-850, GSM-900, DCS-1800, and PCS-1900 based GSM/GPRS/EDGE/UMTS. All receivers and the UMTS transmitter use the radioOne[1]Zero-IF architecture to eliminate intermediate frequencies, directly converting signals between RF and baseband. The quad-band GSM transmitters use a baseband-to-IF upconversion followed by an offset phase-locked loop that translates the GMSK-modulated or 8-PSK-modulated signal to RF.
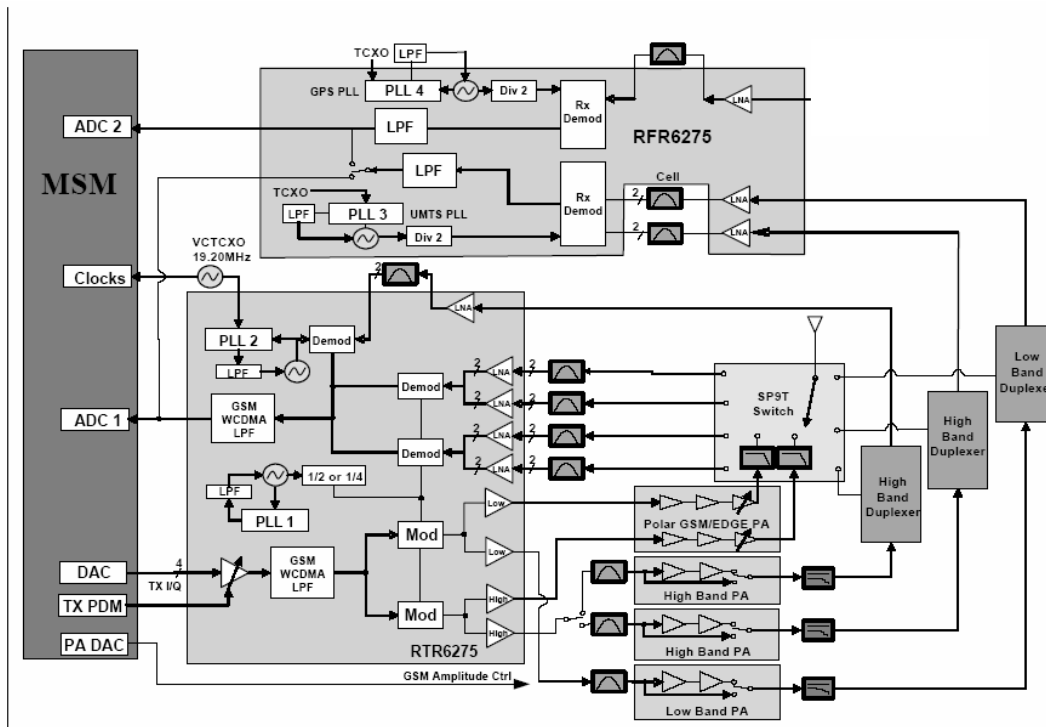
Fig 1.1 Block diagram of RF part

A generic, high-level functional block diagram of CU515 is shown in Figure 1-1. One antenna collects base station forward link signals and radiates handset reverse link signals. The antenna connects with receive and transmit paths through a FEM(Front End Module) (plustwo duplexers for UMTS high-band and low-band operations).

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[1] QUALCOMM's branded chipset that implements a Zero-IF radio architecture.

3. TECHNICAL BRIEF

The UMTS receive paths each include an LNA, an RF band-pass filter, and a downconverter that translate the signal directly from RF-to-baseband using radioOne ZIF techniques. The high-band UMTS receive path and low-band path are accommodated in the RFR6275 IC. The RFIC.s Rx analog baseband outputs, for the receive chains, connect to the MSM IC. The UMTS and GSM Rx baseband outputs share the same inputs to the MSM IC (at ADC1).

For the transmit chains, the RTR6275 IC directly translates the Tx baseband signals (from the MSM device) to an RF signal using an internal LO generated by integrated on-chip PLL and VCO. The RTR6275 IC outputs deliver fairly high-level RF signals that are first filtered by Tx SAWs and then amplified by their respective UMTS PAs. The high- and low-band UMTS RF transmit signals emerge from the RTR6275 transceiver.

In the GSM receive path, the received RF signals are applied through their band-pass filters and down-converted directly to baseband in the RTR6275 transceiver IC. These baseband outputs are shared with the UMTS receiver and routed to the MSM IC for further signal processing. The RFR6275 GSM/UMTS IC receiver baseband outputs share the same interface to the MSM IC input ADC as the RTR6275 IC baseband outputs.

The GSM/EDGE transmit path employs one stage of up-conversion and, in order to improve efficiency, is divided into phase and amplitude components to produce an open-loop Polar topology:

1. The on-chip quadrature up-converter translates the GMSK-modulated signal or 8-PSK modulated signal, to a constant envelope phase signal at RF;

2. The amplitude-modulated (AM) component is applied to the ramping control pin of Polar power amplifier from a DAC within the MSM

CU515 power supply voltages are managed and regulated by the PM6650 Power Management IC. This versatile device integrates all wireless handset power management, general housekeeping, and user interface support functions into a single mixed signal IC. It monitors and controls the external power source and coordinates battery recharging while maintaining the handset supply voltages using low dropout, programmable regulators.

The device's general housekeeping functions include an ADC and analog multiplexer circuit for monitoring on-chip voltage sources, charging status, and current flow, as well as user-defined off-chip variables such as temperature, RF output power, and battery ID. Various oscillator, clock, and counter circuits support IC and higher-level handset functions. Key parameters such as under-voltage lockout and crystal oscillator signal presence are monitored to protect against detrimental conditions.

3.2 GSM Mode

3.2.1 GSM Receiver

The Dual-mode CU515's receiver functions are split between the three RFICs as follows:

- UMTS-850,1900 operation uses the RFR6275 Receiver ICs to implement the receive signal path, accepting an RF input and delivering analog baseband outputs (I and Q).

- GSM-850, GSM-900, DCS-1800, and PCS-1900 modes both use the RTR6275 IC only. Each mode has independent front-end circuits and down-converters, but they share common baseband circuits (with only one mode active at a time). All receiver control functions are beginning with SBI[2]-controlled parameters.

RF Front end consists of antenna, antenna switch module(DGM099M01) which includes four RX saw filters(GSM850, GSM900, GSM900, DCS and PCS). The antenna switch module allows multiple operating bands and modes to share the same antenna. In CU515, a common antenna connects to one of eight paths: 1) UMTS-850 Rx/Tx, 2) UMTS-1900 Rx/Tx, 3) GSM-850 Rx, 4) GSM-900 Rx, 5) GSM-850 GSM-900 Tx, (Low Band Tx's share the same path) 6) DCS-1800 Rx, and 7) DCS-1800,PCS-1900 Tx(High Band Tx's share the same path), 8) PCS-1900 Rx. UMTS operation requires simultaneous reception and transmission, so the UMTS Rx/Tx connection is routed to a duplexer that separates receive and transmit signals. GSM850/GSM900, DCS, and PCS operation is time division duplexed, so only the receiver or transmitter is active at any time and a frequency duplexer is not required.

ANTENNA SWITCH MODULE LOGIC

DGM099M01

	ANT_SEL0	ANT_SEL1	ANT_SEL2
GSM900/GSM850 TX	HIGH	LOW	HIGH
DCS/PCS TX	LOW	HIGH	HIGH
GSM 850 RX	LOW	LOW	LOW
GSM 900 RX	HIGH	LOW	LOW
DCS RX	HIGH	HIGH	LOW
PCS RX	LOW	HIGH	LOW
UMTS 850	LOW	HIGH	HIGH
UMTS 1900	LOW	LOW	HIGH

Table 1.1 Antenna Switch Module Control logic

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[2] The RFIC operating modes and circuit parameters are MSM-controlled through the proprietary 3-line Serial Bus Interface (SBI). The Application Programming Interface (API) is used to implement SBI commands. The API is documented in AMSS Software-please see applicable AMSS Software documentation for details.

3. TECHNICAL BRIEF

The GSM850, GSM900, DCS, and PCS receiver inputs of RTR6275 are connected directly to the transceiver front-end circuits(filters and antenna switch module). GSM850, GSM900, DCS, and PCS receiver inputs are similar to the RFR6275 UMTS Rx input in that they also use differential configurations to improve common-mode rejection and second-order nonlinearity performance. The balance between the complementary signals is critical and must be maintained from the RF filter outputs all the way into the IC pins

Since GSM850, GSM900, DCS, and PCS signals are time-division duplex (the handset can only receive or transmit at one time), switches are used to separate Rx and Tx signals in place of frequency duplexers - this is accomplished in the switch module.

The GSM850, GSM900, DCS, and PCS receive signals are routed to the RTR6275 through band selection filters and matching networks that transform single-ended 50-Ωsources to differential impedances optimized for gain and noise figure. Similar to the RFR, the RTR input uses a differential configuration to improve second-order inter-modulation and common mode rejection performance. The RTR6275 input stages include MSM-controlled gain

The amplifier outputs drive the RF ports of the quadrature RF-to-baseband downconverters. The downconverted baseband outputs are multiplexed and routed to lowpass filters (one I and one Q) having passband and stopband characteristics suitable for GMSK or 8-PSK processing.

These filter circuits include DC offset corrections. The filter outputs are buffered and passed on to the MSM6260 IC for further processing (an interface shared with the RFR6275 UMTS receiver outputs.
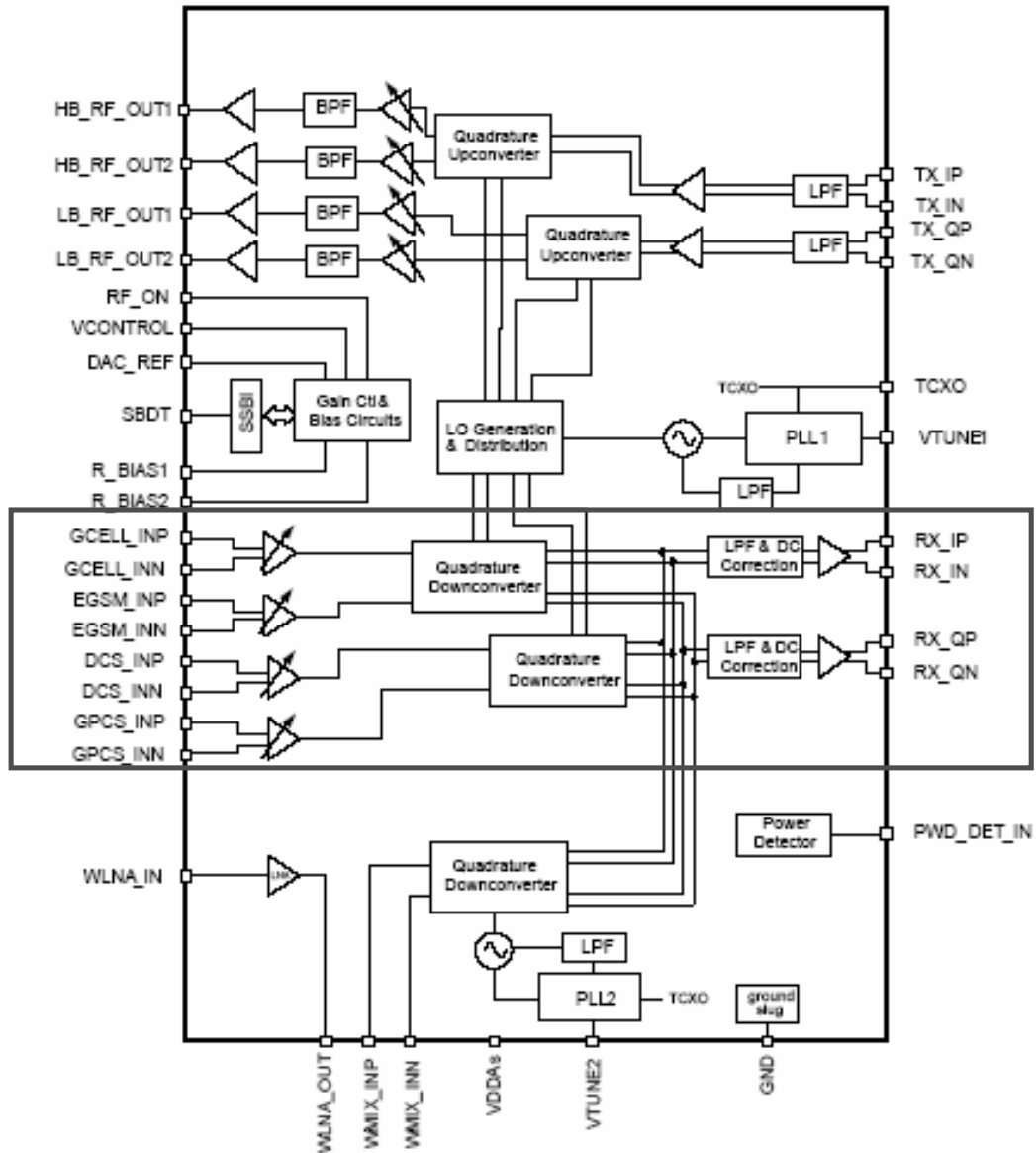
RTR6275 RX feature

3.2.2 GSM Transmitter out put

The RTR6275 transmitter outputs(DA_HB2_OUT and DA_LB1_OUT)include on-chip output matching inductors. 50ohm output impedance is achieved by adding a series capacitor at the output pins. The capacitor value may be optimized for specific applictions and PCB characteristics based on pass-band symmetry about the band center frequency, the suggested starting value is shown in Figure1.2.
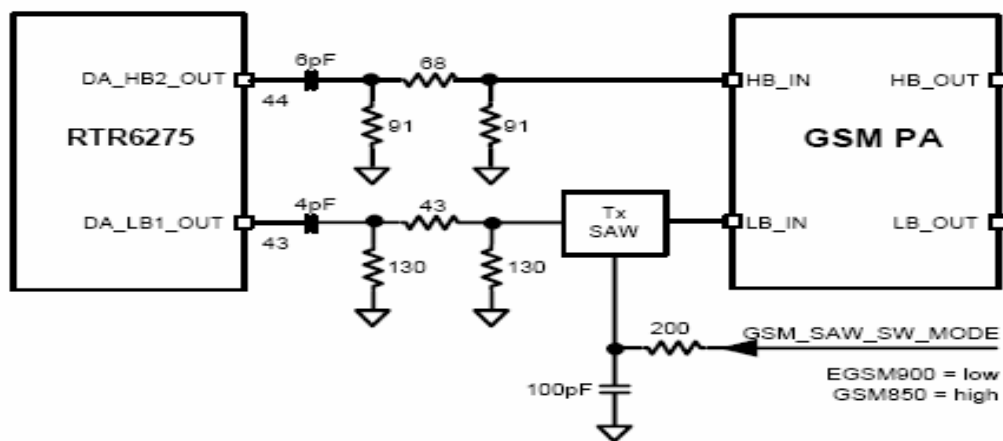
Figure 1.2.2-1 GSM Transmitter matching

The RTR6275 IC is able to support GSM 850/1900 and GSM 1800/1900 mode transmitting. This design guideline shows a quad-band GSM application.

Both high-band and low band outputs are followed by resistive pads to ensure that the load Presented to the outputs remains close to 50ohm. The low-band GSM. Tx path also includes a Tx-band SAW filter to remove noise-spurious components and noise that would be amplified by the PA and appear in the GSM Rx band.

3.3 UMTS Mode

3.3.1 Receiver

The UMTS duplexer receiver output is routed to LNA circuits within the RFR6275 device.

UMTS LNA circuits(one for low-band UMTS and one for high-band UMTS path) separated from all other receive functions contained within the RFR6275 reveiver IC to improve mixer LO to RF isolation- a critical parameter in the ZIF architecture. Isolation is further improved using high-reverse isolation circuits in the LNA designs. The LNA gains are stepped via API control. The IC operating mode and LNA bias currents are automatically adjusted via software to minimize DC power consumption.
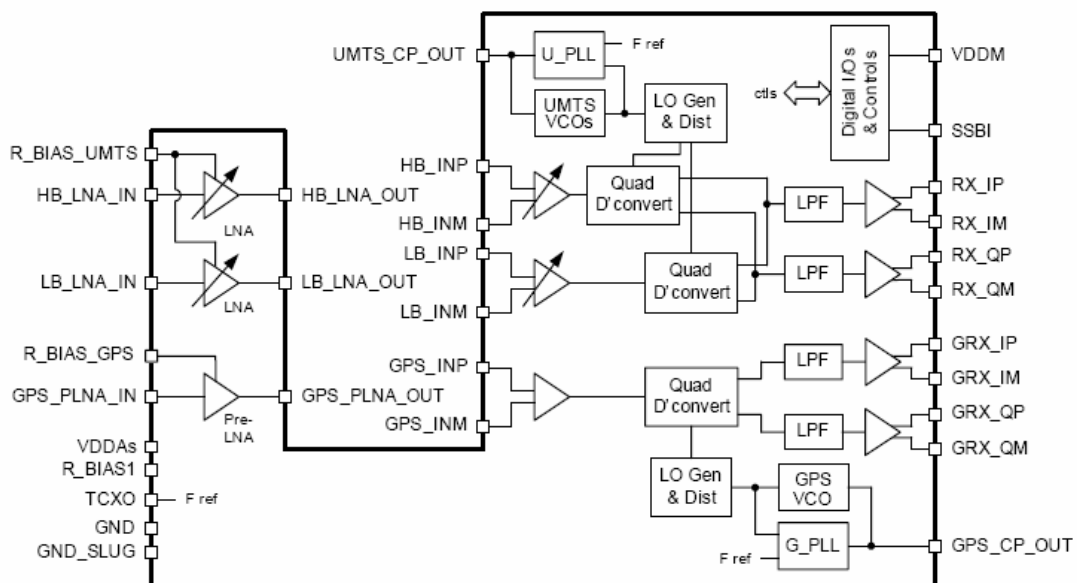
Figure 1.3.1-1 RFR6275 IC functional block diagram

Separate GPS and UMTS down-converters exist within the RFR6275 to allow GPS signals to be processed independently of UMTS signals. The inputs use differential configurations to improve second-order intermodulation and common-mode rejection performance. The differential input gain stage implements MSM IC-controlled gain adjustments to extend receiver dynamic range.

The outputs of the differential amplifiers drive the RF port of the quadrature RF-tobaseband down-converters. The down-converters are routed to low-pass filters (one I and one Q) whose pass-band and stop-band characteristics supplement MSM device processing. These filter circuits allow for DC offset correction and the differential I/Q outputs are buffered to interface with the MSM IC.

. Numerous secondary functions also are integrated on-chip: the Rx LO generation and distribution circuits and various interface, control, and status circuits. An on-chip UMTS VCO is phase locked to the external VC-TCXO signal and processed, by the LO generation and distribution circuits, to create the UMTS Rx LO signals for the quadrature down-converter. A second on-chip GPS VCO is also phase-locked to the VC-TCXO signal to generate the LO signals for the GPS down-converter. The LO signals, applied to their respective mixer, are at frequencies different to that of the VCOs, which is an important consideration for ZIF processing. The QUALCOMM MSM device provides status and control signaling, employing power reduction features (such as selective circuit power-down, gain control, and bias control) to extend handset standby time.

3.3.2 Transmitter

The UMTS Tx path begins with differential baseband signals (I and Q) from the MSM device. mixers. The up-converter output is amplified by multiple variable gain stages that provide transmit AGC control. The AGC output is filtered and applied to the driver amplifier; this output stage includes an integrated matching inductor that simplifies the external matching network to a single series capacitor to achieve the desired 50-Ωinterface.

The RTR6275 UMTS output is routed to its power amplifier through a bandpass filter, and delivers fairly high-level signals that are filtered and applied to the PA. Transmit power is delivered from the duplexer to the antenna through the switch module.

The transceiver LO synthesizer is contained within the RTR6275 IC with the exception of the off-chip loop filter components and the VC-TCXO. This provides a simplified design for multimode applications. The PLL circuits include a reference divider, phase detector, charge pump, feedback divider, and digital logic generator.

UMTS Tx. Using only PLL1, the LO generation and distribution circuits create the necessary LO signals for nine different frequency converters. the UMTS transmitter also employs the ZIF architecture to translate the signal directly from baseband to RF. This requires F_{LO} to equal F_{RF}, and the RTR6275 IC design achieves this without allowing F_{VCO} to equal F_{RF}.

The RTR6275 IC is able to support UMTS 2100/1900 and UMTS 850 mode transmitting. This design guideline shows only UMTS 2100/1900 and UMTS 850 applications.
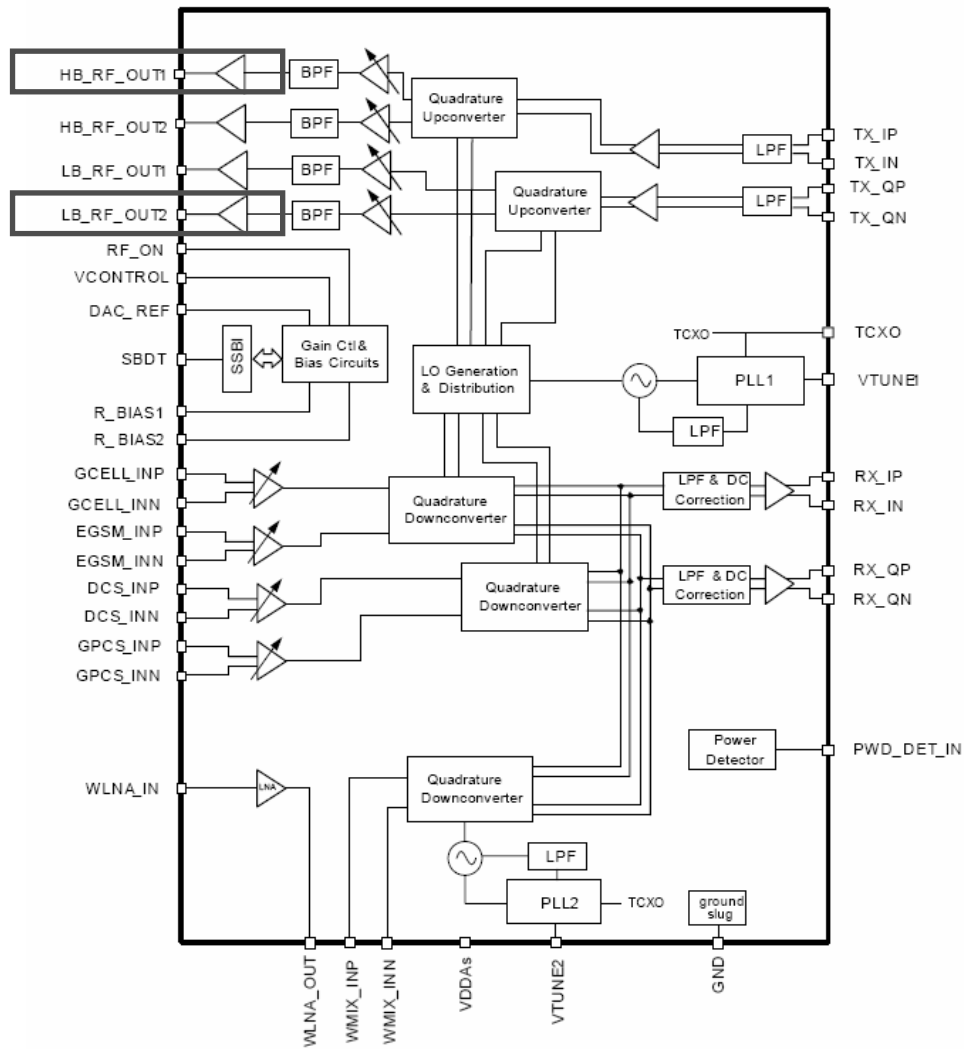
RTR6275 IC functional block diagram

3.4 LO Phase-locked Loop

All LO functions are fully integrated on-chip and do not require user any adjustment. QUALCOMM has established and implemented frequency plans and LO generation schemes that support the radioOne Platform B-series chipset. Only one area requires handset designer attention: the loop filters relating to each PLL. These are addressed in this chapter. All the UMTS Rx, GSM Rx, and GPS PLL circuits are included within the RFICs: reference dividers, phase detectors, charge pumps, feedback dividers, and digital logic. There are four integrated VCOs and PLLs within the Platform B (RFCMOS) chipset as shown in Figure 5-1 and Figure 5-2:

■ Figure 5-1

1. PLL1, within the RTR6275 IC, produces the LO for up- and down-conversion of GSM Tx/Rx, and UMTS Tx.
2. PLL2, within RTR6275 IC, produces the Rx LO for one of the (high band) UMTS receive Paths.

■ Figure 5-2

3. PLL3, within the RFR6275 IC, produces the Rx LO for the remaining UMTS receive paths.
4. PLL4, within the RFR6275 IC, produces the Rx LO for the GPS receive path.

Within the RFICs, a buffered 19.2 MHz TCXO signal provides the synthesizer input (REF), the frequency reference to which the PLL is phase- and frequency-locked. Thereference is divided by the R-Counters to create a fixed frequency input to the phase detector, FR. The other phase detector input (FV) varies as the loop acquires lock, and is generated by dividing the VCO frequency using the feedback path N-Counter. The closed loop will force FV to equal FR when locked. If the loop is not locked, the error between FV and FR will create an error signal at the output of the charge pump. This error signal is filtered by the loop filter components and applied to the VCO, tuning the output frequency so that the error is decreased. Ultimately, the loop forces the error to approach zero and the PLL is phase- and frequency-locked.
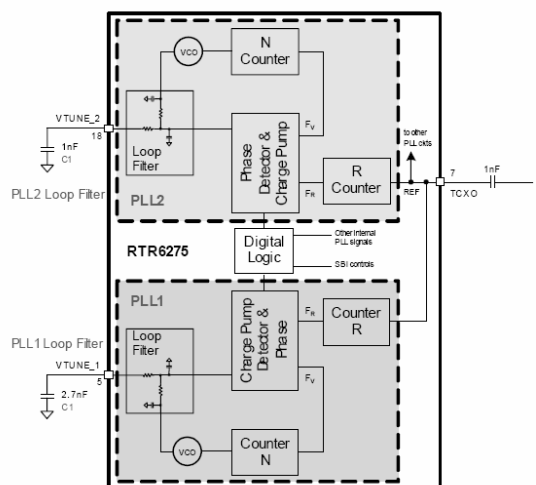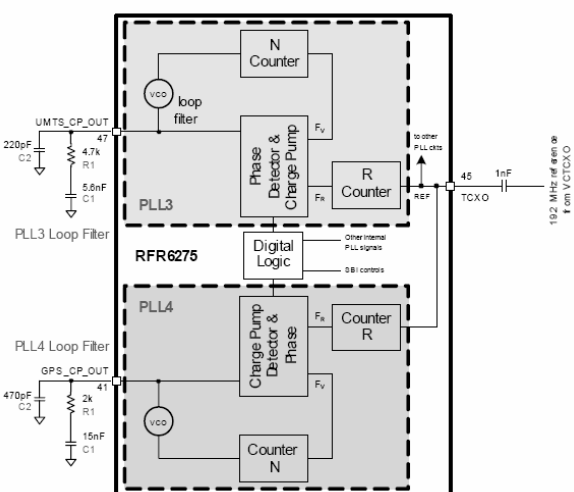
| Figure 5-1 | Figure 5-2 |

RFR6275 PLLs functional block diagram

3.4.1 UMTS Rx PLL (PLL3)

QUALCOMM provides a baseline PLL3 design for UMTS Rx. Loop filter component reference designators are shown in Figure 5-2.

Table_ Baseline PLL3 design for UMTS Rx

Band/mode	Loop parameters					Settling time (µs)	Filter component values				
	Kvco (MHz/V)	CP_I (mA)	PM (deg)	L_BW (kHz)			C1 (nF)	R1 (kΩ)		C2 (pF)	
UMTS 850 Rx	On-chip	3.68	58.9	35		250	5.6	4.7		220	
UMTS 1900 Rx	On-chip	3.13	60.1	35		250	5.6	4.7		220	

Notes: 1. The performance values listed in this table are based on simulation results and are provided as a starting point for handset designers. Synthesizer performance is still being evaluated and optimized during this document release. Loop parameter, settling time, and filter component values are all expected to change when the optimization effort is completed. Future revisions will include expected performance based on measured data.
2. For CU515 C1_2.2nF C2_150pF R1_10k
3. Loop parameter acronyms are: Kvco VCO tuning sensitivity CP_I Charge pump current (controlled by API software) PM Phase margin L_BW Loop bandwidth
4. The listed VCO tuning sensitivity is based on QUALCOMM internal Rx VCO.
5. The listed settling times are for switching between channels at opposite ends of the active band and settling to within 250 Hz of the final frequency.
6. Test and evaluation efforts were ongoing at the time of this document release. Check future versions for design recommendations based on our test results.

3.4.2 Transceiver PLL (PLL1)

The PLL1 within the RTR6275 IC creates the Rx LO for all the GSM receive bands and GSM transmit bands as well as the UMTS transmit bands. The PLL1 of RTR6275 IC (with on-chip VCO) creates the transceiver LO that supports the quad-band GSM receivers and the GSM transmitters as well as the tri-band UMTS transmit outputs. All LO functional blocks are integrated into the RTR6275 IC except for some loop filter capacitors (Figure 5-1). On-chip circuits include reference divider, phase detector, charge pump, VCO, feedback divider, and digital logic status. The off-chip loop filter capacitors allow minimal optimization of PLL performance characteristics (stability, transitory response, settling time, and phase noise) for different applications.

3.5 Off-chip RF Components

3.5.1 Antenna switch module

TERMINAL CONFIGURATION

Terminal No.	Terminal Name	Terminal No.	Terminal Name
(1)	GSM1800Rx	(15)	UMTS1
(2)	GSM1800Rx	(16)	UMTS2
(3)	GSM1900Rx	(17)	NC
(4)	GSM1900Rx	(18)	GND
(5)	GSM900Rx	(19)	ANT
(6)	GSM900Rx	(20)	GND
(7)	GSM850Rx	(21)	GND
(8)	GSM850Rx	(22)	GSM1800/1900Tx
(9)	GND	(23)	GND
(10)	Vdd	(24)	GND
(11)	Vc4	(25)	GSM850/900Tx
(12)	Vc3	(26)	GND
(13)	Vc2	(27)	GND
(14)	Vc1	(28)	GND

CONTROL LOGIC

Mode	Vc1	Vc2	Vc3	Vc4	Vdd
GSM850/900 Tx	1.8-3.0V	1.8-3.0V	0-0.2V	0-0.2V	2.4-3.0V
GSM1800/GSM1900 Tx	1.8-3.0V	0-0.2V	0-0.2V	0-0.2V	2.4-3.0V
GSM850 Rx	0-0.2V	0-0.2V	0-0.2V	0-0.2V	2.4-3.0V
GSM900 Rx	0-0.2V	0-0.2V	1.8-3.0V	0-0.2V	2.4-3.0V
GSM1800 Rx	0-0.2V	1.8-3.0V	1.8-3.0V	0-0.2V	2.4-3.0V
GSM1900 Rx	0-0.2V	1.8-3.0V	0-0.2V	0-0.2V	2.4-3.0V
UMTS1	1.8-3.0V	0-0.2V	1.8-3.0V	0-0.2V	2.4-3.0V
UMTS2	1.8-3.0V	0-0.2V	1.8-3.0V	1.8-3.0V	2.4-3.0V
Idle	0-0.2V	0-0.2V	0-0.2V	0-0.2V	0-0.2V

3.5.2 UMTS duplexer

A UMTS duplexer splits a single operating band into receive and transmit paths. Important performance requirements include;

■ Insertion loss . this component is also in the receive and transmit paths ; In the CU515 typical losses : UMTS1900_ Tx = 2.1 dB, UMTS1900_ Rx = 2.8 dB and UMTS850_ Tx =1.9 dB, UMTS850_ Rx = 2.7 dB

■ Out-of-band rejection or attenuation . the duplexer provides input selectivity for the receiver, output filtering for the transmitter, and isolation between the two. Rejection levels for both paths are specified over a number of frequency ranges. Two Tx-to-Rx isolation levels are critical to receiver performance:

■ Rx-band isolation . the transmitter is specified for out-of-band noise falling into the Rx band. This noise leaks from the transmit path into the receive path, and must be limited to avoid degrading receiver sensitivity. The required Rx-band isolation depends on the PA out of-band noise levels and Rx-band losses between the PA and LNA. Minimum duplexer Rx band isolation value is about 45 dB.

■ Tx-band isolation . the transmit channel power also leaks into the receiver. In this case, the leakage is outside the receiver passband but at a relatively high level. It combines with Rx band jammers to create cross-modulation products that fall in-band to desensitize the receiver. The required Tx-band isolation depends on the PA channel power and Tx-band losses between the PA and LNA. Minimum duplexer Tx-band isolation value is about 55 dB.

■ Passband ripple . the loss of this fairly narrowband device is not flat across its passband. Passband ripple increases the receive or transmit insertion loss at specific frequencies, creating performance variations across the band.s channels, and should be controlled.

■ Return loss . minimize mismatch losses with typical return losses of 10 dB or more (VSWR <2:1).

■ Power handling . high power levels in the transmit path must be accommodated without degraded performance. The specified level depends on the operating band class and mobile station class (per the applicable standard), as well as circuit losses and antenna EIRP. Several duplexer characteristics depend upon its source and load impedances. QUALCOMM strongly recommends an isolator be used between the UMTS PA and duplexer to assure proper performance.

3. TECHNICAL BRIEF

3.5.3 UMTS Power Amplifier

UMTS850/UMTS1900 Power Amplifier module.

The AWT6321 addresses the demand for increased integration in dual-band handsets for North American CDMA network deployments. The small footprint 3 mm x 5 mm x 1 mm surface mount RoHS compliant package contains independent RF PA paths to ensure optimal performance in both frequency bands, while achieving a 25% PCB space savings compared with solutions requiring two single-band PAs. The package pinout was chosen to enable handset manufacturers to easily route VCC to both power amplifiers and simplify control with a common VMODE pin. The device is manufactured on an advanced InGaP HBT MMIC technology offering state-of-the-art reliability, temperature stability, and ruggedness. The AWT6321 is part of ANADIGICS' High- Efficiency-at-Low-Power (HELP™) family of CDMA power amplifiers, which deliver low quiescent currents and significantly greater efficiency without a costly external DAC or DC-DC converter.

Block Diagram

(T$_c$ = +25 °C, V$_{BATT}$ = V$_{CC}$ = +3.4 V, V$_{ENABLE}$ = +2.4 V, 50 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain	25 15 16	26.5 16.5 17.5	30 19 20	dB	P$_{OUT}$ = +28 dBm, V$_{MODE}$ = 0 V P$_{OUT}$ = +16 dBm, V$_{MODE}$ = +2.4 V P$_{OUT}$ = +17 dBm, V$_{MODE}$ = +2.4 V, V$_{CC}$ = +3.7 V
Adjacent Channel Power at ± 885 kHz offset [1] Primary Channel BW = 1.23 MHZ Adjacent Channel BW = 30 kHz	- - -	-50 -57 -55	-47 -47 -47	dBc	P$_{OUT}$ = +28 dBm, V$_{MODE}$ = 0 V P$_{OUT}$ = +16 dBm, V$_{MODE}$ = +2.4 V P$_{OUT}$ = +17 dBm, V$_{MODE}$ = +2.4 V, V$_{CC}$ = +3.7 V
Adjacent Channel Power at ± 1.98 MHz offset [1] Primary Channel BW = 1.23 MHZ Adjacent Channel BW = 30 kHz	- -	-63 -61	-57 -57	dBc	P$_{OUT}$ = +28 dBm, V$_{MODE}$ = 0 V P$_{OUT}$ = +16 dBm, V$_{MODE}$ = +2.4 V
Power-Added Efficiency [1]	36 17	38 22	- -	%	P$_{OUT}$ = +28 dBm, V$_{MODE}$ = 0 V P$_{OUT}$ = +16 dBm, V$_{MODE}$ = +2.4 V
Quiescent Current (Icq)	-	14	20	mA	V$_{MODE}$ = +2.4 V, Low Bias
Enable Current	-	0.4	0.8	mA	through V$_{EN}$ pin, V$_{MODE}$ = +2.4 V
Battery Current	-	2.5	5	mA	through V$_{BATT}$ pin, V$_{MODE}$ = +2.4 V
Mode Control Current	-	0.5	0.8	mA	through V$_{MODE}$ pin, V$_{MODE}$ = +2.4 V
Leakage Current	-	<1	5	μA	V$_{CC}$ = +4.2 V, V$_{EN}$ = 0 V, V$_{MODE}$ = 0 V
Noise in Receive Band	-	-133	-131	dBm/Hz	869 MHz to 894 MHz
Harmonics 2fo 3fo, 4fo	- -	-42 -50	-30 -30	dBc	
Input Impedance	-	-	2:1	VSWR	
Spurious Output Level (all spurious outputs)	-	-	-65	dBc	P$_{OUT}$ ≤ +28 dBm In-band Load VSWR < 5:1 Out-of-band Load VSWR < 10:1 Applies over all operating conditions
Load mismatch stress with no permanent degradation or failure	8:1	-	-	VSWR	Applies over all operating conditions

Electrical specifications-Cellular Band

3. TECHNICAL BRIEF

(T$_c$ = +25 °C, V$_{BATT}$ = V$_{cc}$ = +3.4 V, V$_{ENABLE}$ = +2.4 V, 50 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain	25 13 14	26.5 14.5 16	29 18 18	dB	P$_{OUT}$ = +28 dBm, V$_{MODE}$ = 0 V P$_{OUT}$ = +16 dBm, V$_{MODE}$ = +2.4 V P$_{OUT}$ = +18 dBm, V$_{MODE}$ = +2.4 V, V$_{cc}$ = +3.7 V
Adjacent Channel Power at ±1.25 MHz offset Primary Channel BW - 1.23 MHz Adjacent Channel BW = 30 kHz	- - -	-51 -58 -52	-47 -47 -47	dBc	P$_{OUT}$ = +28 dBm, V$_{MODE}$ = 0 V P$_{OUT}$ = +16 dBm, V$_{MODE}$ = +2.4 V P$_{OUT}$ = +18 dBm, V$_{MODE}$ = +2.4 V, V$_{cc}$ = +3.7 V
Adjacent Channel Power at ±2.25 MHz offset Primary Channel BW - 1.23 MHz Adjacent Channel BW = 30 kHz	- -	-62 -62	-57 -57	dBc	P$_{OUT}$ = +28 dBm, V$_{MODE}$ = 0 V P$_{OUT}$ = +16 dBm, V$_{MODE}$ = +2.4 V
Power-Added Efficiency	36 16	39 17	- -	%	P$_{OUT}$ = +28 dBm, V$_{MODE}$ = 0 V P$_{OUT}$ = +16 dBm, V$_{MODE}$ = +2.4 V
Quiescent Current (Icq)	-	14	20	mA	through V$_{cc}$ pin, V$_{MODE}$ = +2.4 V
Enable Current	-	0.3	0.8	mA	through V$_{EN}$ pin, PA "on"
Mode Control Current	-	0.3	0.8	mA	through V$_{MODE}$ pin, V$_{MODE}$ = +2.4 V
Battery Current	-	3	5	mA	through V$_{BATT}$ pin, V$_{MODE}$ = +2.4 V
Leakage Current	-	<1	5	µA	V$_{cc}$ = +4.2 V, V$_{EN}$ = 0 V, V$_{MODE}$ = 0 V
Noise in Receive Band	-	-135	-133	dBm/Hz	1930 MHz to 1990 MHz
Harmonics 2fo 3fo, 4fo	- -	-43 -55	-30 -30	dBc	
Input Impedance	-	-	2:1	VSWR	
Spurious Output Level (all spurious outputs)	-	-	-65	dBc	P$_{OUT}$ ≤ +28 dBm In-band load VSWR < 5:1 Out-of-band load VSWR < 10:1 Applies over all operating ranges
Load mismatch stress with no permanent degradation or failure	8:1	-	-	VSWR	Applies over full operating range

Electrical specifications - PCS Band

3.5.4 Thermistor

This thermistor senses temperature variations around UMTS PA to adjust PA gain deviation for assure compliance with the applicable transmit power control standards. Negative temperature compensation thermistor is used in the CU515.

3.5.5 GSM/GPRS/EDGE Power amplifier

Product Description

The TQM7M5003 is a small (7x7mm), GSM/EDGE PAM for handset applications. This module has been optimized for excellent EDGE efficiency, ACPR and EVM in an open loop polar modulation environment at EDGE class E2+ operation while maintaining high GSM/GPRS efficiency. The TQM7M5003 is fan-out compatible with TriQuint's other power amplifier modules.
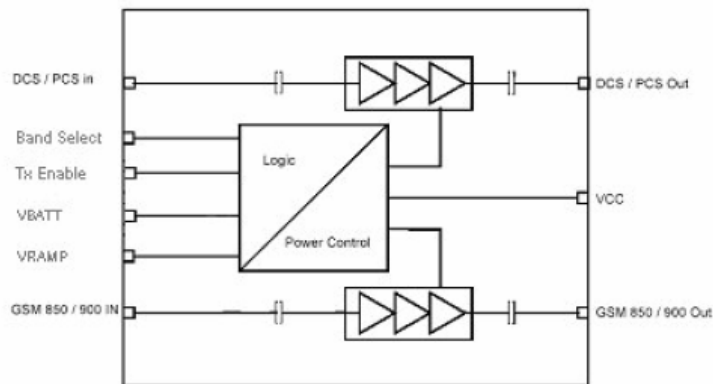
GSM PA functional block diagram

Parameter	Conditions	Min.	Typ/Nom	Max.	Units
Supply Voltage, V_{BATT}		3.0	3.5	4.8	V_{dc}
Supply Current, I_{BATT}	Pout = max			2	A
Transmit Enable, TX_EN Voltage	Logic High	1.25		3	V
	Logic Low	-0.2		0.4	V
Transmit Enable, TX_EN Current	Logic High			10	µA
	Logic Low			1	µA
Band Select Voltage	Logic High: DCS	1.25		3	V
	Logic Low: GSM	-0.2		0.4	V
Band Select Current- DCS/GSM	High/Low			10	µA
Leakage Current TX_EN Low	Vramp = 0.2V; T=-25°C, +85°C		5	15	µA
Input and Output Load Impedance			50		Ω
$V_{ramp\ MIN}$			0	0.25	V
V_{ramp}		0		1.6	V
V_{ramp} Input Current	Vramp = 0.2V, 1.6V			10	µA
Operating Case Temperature		-25		+85	°C

Operating Parameter

3.5.6 UMTS Rx RF filter

Filter1 869 ~ 894MHz Filter2 1805 ~1880MHz

An RF filter is located between the UMTS LNA and mixer. Insertion loss is important, but not as critical as losses before the LNA. The most important parameters of this component include:

■ Out-of-band rejection or attenuation levels, usually specified to meet these conditions:

❑ Far out-of-band signals - ranging from DC up to the first band of particular concern and from the last band of particular concern to beyond three times the highest passband frequency.

❑ Tx-band leakage - the transmitter channel power, although attenuated by the duplexer, still presents a cross-modulation threat in combination with Rx-band jammers. The RF filter must provide rejection of this Tx-band leakage.

❑ Other frequencies of particular concern . bands known to include other wireless transmitters that may deliver significant power levels to the receiver input.

■ Phase and amplitude balance - the ZIF architecture requires well-balanced differential inputs to the RFR6202 IC. This is accomplished by the RF filter which takes a single-ended output from the RFL6202 IC and provides differential outputs having nominal 180° phase separation. Phase and/or amplitude imbalance causes degraded common-mode rejection and second-order nonlinearity, so their requirements are specified jointly.

❑ ± 3 degrees and ± 1 dB

❑ -12 to + 3 degrees and ± 0.7 dB

Of course, passband ripple and return loss are still important in all cases for the same reasons explained in the antenna switch module and duplexer sections.

3.5.7 VCTCXO

The Voltage Controlled Temperature Compensated Crystal Oscillator (VCTCXO) provides the reference frequency for all RFIC synthesizers as well as clock generation functions within the MSM6260 IC. The oscillator frequency is controlled by the MSM6260's TRK_LO_ADJ pulse density modulated signal in the same manner as the transmit gain control.

The filtered PDM signal results in an analog control signal into the VCTCXO tuning port whose voltage is directly proportional to the density of the digital bit stream. The MSM device varies the pulse density to change the analog control voltage that sets the oscillator frequency - all within a feedback control loop that minimizes handset frequency drift relative to the network.

3.5.8 Bluetooth

The MSM6260 includes BT baseband embedded BT 1.1 compliant baseband core, so the other bluetooth components are an bluetooth RF module and Antenna. Figure1.5.12-1 shows the bluetooth system architecture in the CU515.
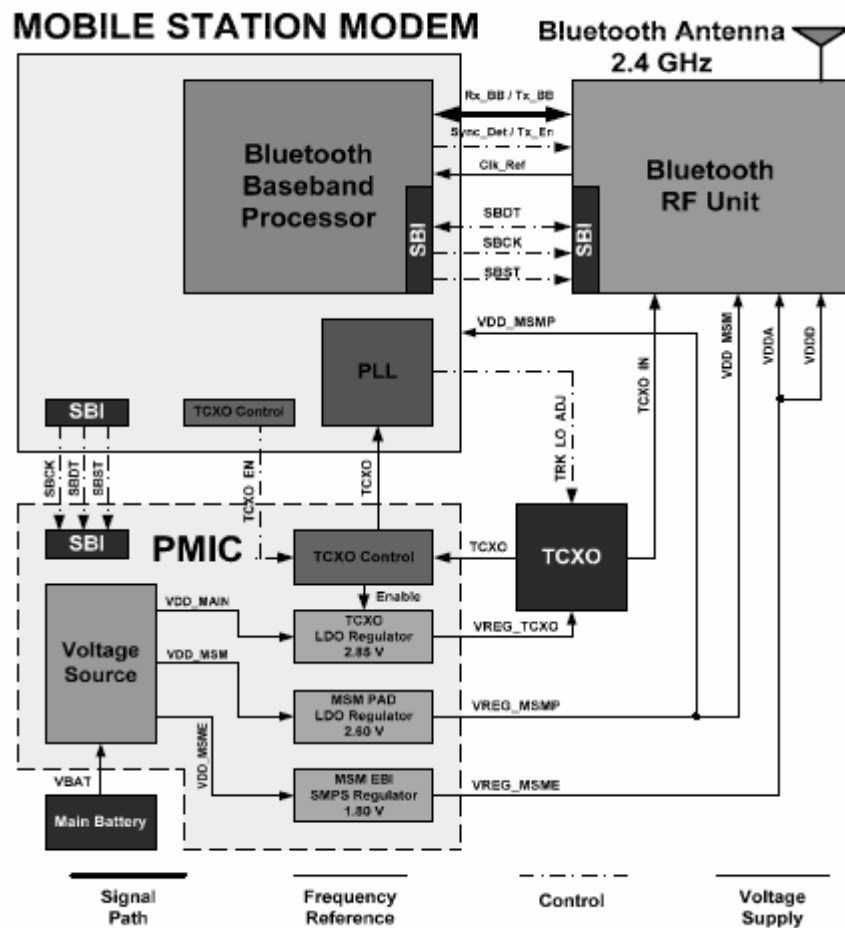
Figure1.5.12-1 Bluetooth system architecture

3. BB Technical Description

3.6 Digital Baseband(DBB/MSM6260)

3.6.1 General Description

A. Features(MSM6260)

· Support for multimode operation - HSDPA, tri-band WCDMA (UMTS), quad GSM/GPRS/EDGE, and GPS.

· Support for HSDPA downlink up to 3.6 Mbps

· Support for WCDMA (UMTS) uplink data rate up to 384 kbps

· High-performance ARM926EJ-S running at up to 270 MHz for 3.6 Mbps HSDPA

· ARM Jazelle Java hardware acceleration for faster Java-based games and other applets

· QDSP4000 high-performance DSP cores

· Integrated gpsOne position location technology functionality

· Integrated Bluetooth 1.2 baseband processor for wireless connectivity to peripherals

· Qcamera with 30 fps QCIF viewfinder resolution, and support for 3 MP camera sensors

· Direct interface to digital camera module with video front end (VFE) image processing

· True 3D graphics for advanced wireless gaming

· SecureMSM v2.0 includes support for Open Mobile Alliance (OMA) DRM v2.0, SIM-lock and IMEI integrity. Support for Qfuse.

· Audio on par with portable music players

· Vocoder support (AMR, FR, EFR, HR)

· Advanced 14 x 14 mm, 0.5-mm pitch, 409-pin lead-free CSP packaging technology

· SD/SDIO hardware support
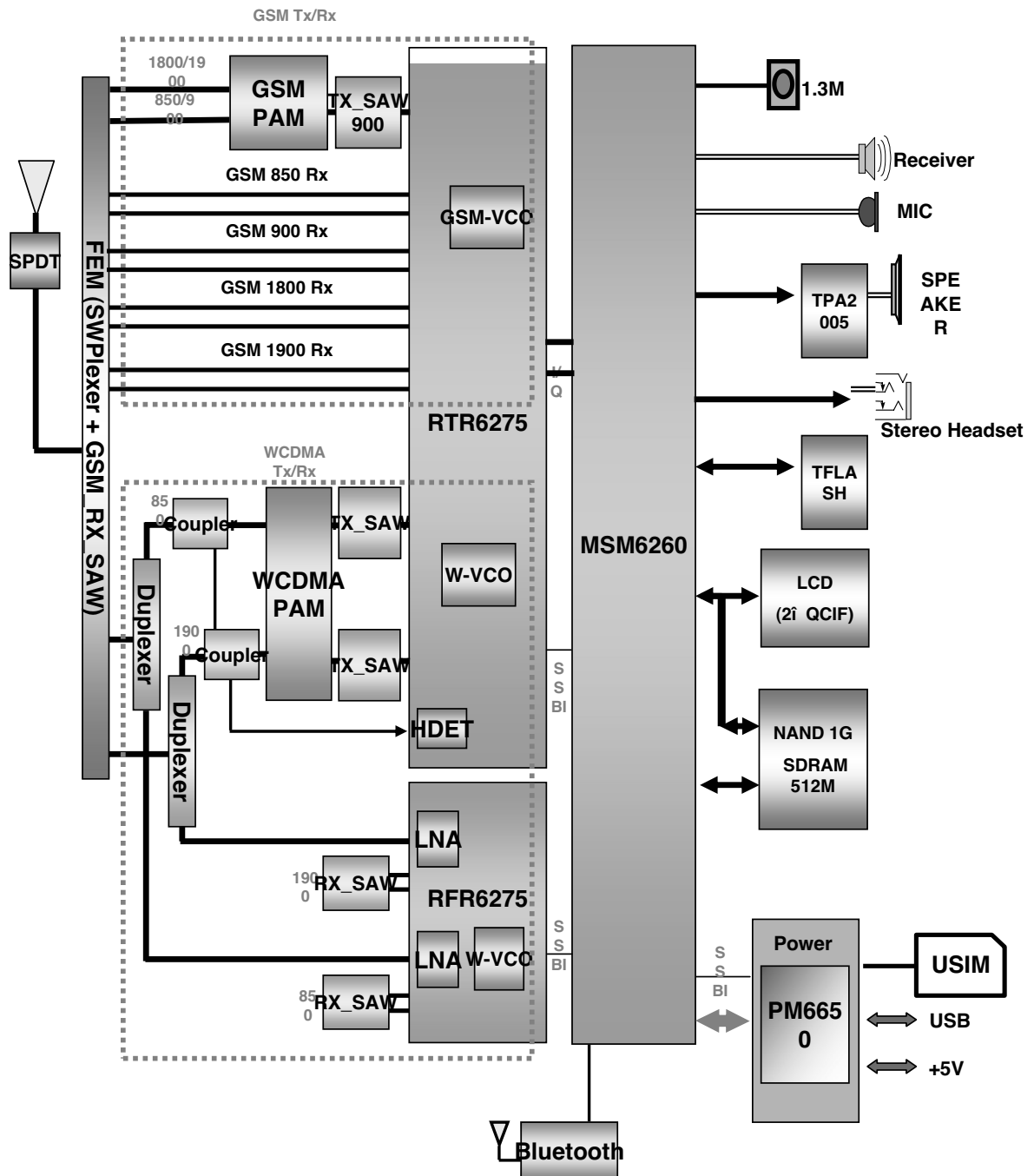
Figure. Simplified Block Diagram

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3.7 Block Diagram(MSM6260)
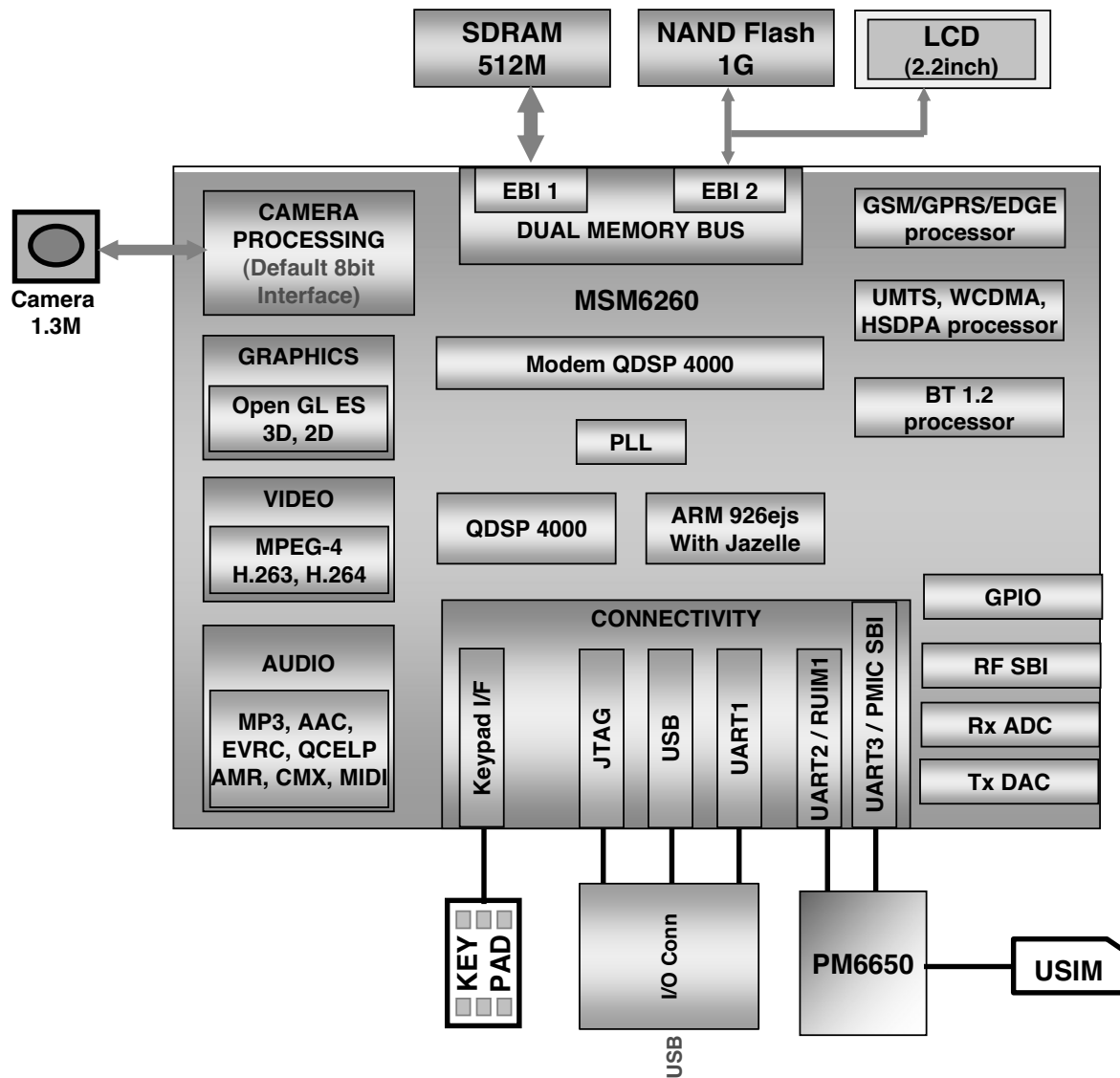
Figure. Simplified Block Diagram of MSM6260

3.8 Subsystem(MSM6260)

3.8.1 ARM Microprocessor Subsystem

The MSM6260 device uses an embedded ARM926EJ-S microprocessor. This microprocessor, through the system software, controls most of the functionality for the MSM, including control of the external peripherals such as the keypad, LCD, SDRAM, and NAND-Flash devices. Through a QUALCOMM proprietary serial bus interface (SBI) the ARM926EJ-S configures and controls the functionality of the RTR6275, RFR6275 and PM6650 devices.

3.8.2 WCDMA R99 features

The MSM6260 device supports the W-CDMA FDD release 99, including the following features:

■ All modes and data rates for W-CDMA frequency division duplex (FDD), with the following restrictions:

❑ The downlink supports the following specifications:

- Up to four physical channels, including the broadcast channel (BCH), if present

- Up to three dedicated physical channels (DPCHs)

- Spreading factor (SF) range support from 4 to 256

- The following transmit diversity modes are supported:

Space time transmit diversity (STTD)

Time-switched transmit diversity (TSTD)

Closed-loop feedback transmit diversity (CLTD)

■ The uplink supports the following specifications:

❑ The uplink provides the following UE support:

- One physical channel, eight TrCH, and 16 TrBks starting at any frame boundary

- A maximum data rate of 384 kbps

❑ Full SF range support from 4 to 256

■ SMS (CS and PS)

■ PS data rate - 384 kbps DL / 384 kbps UL

■ CS data rate - 64 kbps DL / 64 kbps UL

■ AMR (all rates)

3. TECHNICAL BRIEF

3.8.3 GSM features

The following GSM modes and data rates are supported by the MSM6260 device hardware. Support modes conform to release '99 specifications of the sub-feature.

■ Voice features

❑ FR

❑ EFR

❑ AMR

❑ HR

❑ A5/1, A5/2, and A5/3 ciphering

■ Circuit-switched data features

❑ 9.6k

❑ 14.4k

❑ Fax

❑ Transparent and non-transparent modes for CS data and fax

❑ No sub-rates are supported

3.8.4 GPRS features

■ Packet switched data (GPRS)

❑ DTM (Simple Class A) operation

❑ Multi-slot class 12 data services

❑ CS schemes: CS1, CS2, CS3, and CS4

❑ GEA1, GEA2, and GEA3 ciphering

■ Maximum of four Rx timeslots per frame

3.8.5 EDGE features

■ EDGE E2 power class for 8 PSK
■ DTM (simple Class A), multi-slot class 12
■ Downlink coding schemes - CS 1-4, MCS 1-9
■ Uplink coding schemes - CS 1-4, MCS 1-9
■ BEP reporting
■ SRB loopback and test mode B
■ 8-bit, 11-bit RACH
■ PBCCH support
■ 1 phase/2 phase access procedures
■ Link adaptation and IR
■ NACC, extended UL TBF

3.8.6 MSM6260 device audio processing features

- Integrated wideband stereo CODEC
  - ❑ 16-bit DAC with typical 88 dB dynamic range
  - ❑ Supports sampling rates up to 48 kHz on the speaker path and 16 kHz on the microphone path
- VR- Voice mail + voice memo
- Acoustic echo cancellation
- Audio AGC
- Audio Codecs: AMR-NB, AAC, AAC Plus, Enhanced AAC Plus, Windows Audio v9, Real Audio 8 (G2)
- Internal vocoder supporting AMR, FR, EFR, and HR

3.8.7 MSM6260 microprocessor subsystem

- Industry standard ARM926EJ-S embedded microprocessor subsystem
  - ❑ 16 kB instruction and 16 kB data cache
  - ❑ Instruction set compatible with ARM7TDMI®
  - ❑ ARM version 5TEJ instructions
  - ❑ Higher performance 5 stage pipeline, Harvard cached architecture
  - ❑ Higher internal CPU clock rate with on-chip cache
- Java hardware acceleration
- Enhanced memory support
  - ❑ 75 MHz and 90 MHz bus clock for SDRAM
  - ❑ 32-bit SDRAM
  - ❑ Dual memory buses separating the high-speed memory subsystem (EBI1) from low-speed peripherals (EBI2) such as LCD panels
  - ❑ 1.8 V or 2.6 V memory interface support (excluding EBI1)
  - ❑ NAND FLASH memory interface
    - 8/16-bit data I/O width NAND flash support
    - 1- or 4-bit ECC
    - 512-byte/2KB page-size support
    - 2 chip selects supported for NAND Flash
    - Boot from NAND
    - Low-power SDRAM (LP-SDRAM) interface
- Internal watchdog and sleep timers

3. TECHNICAL BRIEF

3.8.8 Supported interface features

■ USB On-the-Go core supports both slave and host functionality
■ Three universal asynchronous receiver transmitter (UART) serial ports
■ USIM controller (via UART)
■ Integrated 4-bit secure digital (SD) controller for SD and Mini SD cards
■ Parallel LCD interface
■ General-purpose I/O pins
■ External keypad interface

3.8.9 Supported multimedia features

■ Provide additional general purpose MIPS by using:

  ❑ Two QDSP4000s

  ❑ Dedicated hardware accelerators and compression engines
■ Improve Java, BREW, and game performance

  ❑ Integrated Java and 2D/3D graphics accelerator with Sprite engine
■ Enable various accessories via USB host connectivity.

  ❑ Integrated USB host controller functionality
■ Enable compelling visual and audio applications.

Qcamera™

■ High-quality digital camera processing, supporting CCD or CMOS image sensors up to 3 MP
■ 30 fps QCIF viewfinder

Qtv™

■ Audio and video decoder that supports VOD, MOD and Broadcast multimedia services.
■ Audio CODECs supported: AMR-NB, AAC, AAC Plus, Enhanced AAC Plus, Windows® Audio v9, RealAudio® v8
■ Integrated stereo wideband Codec for music/digital clips
■ CMX
■ Video Codecs supported: MPEG-4, H.263, H.264, Windows Media® v9 and RealNetworks® v10

Video telephony services: Qvideophone™

■ A two-way mobile video conferencing solution that delivers 15 fps @ QCIF, 64kbps
■ Video CODECs supported: MPEG-4 and H.263
■ Audio CODECs supported: AMR-NB

Qcamcorder™

- Real time mobile video encoder
- Video CODECs supported: MPEG-4, H.263
- Audio CODECs supported: AMR-NB
- Recording performance: 15 fps @ QCIF, 192 kbps
- Video telephony at 15 frames per second(fps), QCIF resolution video encode at 15 fps at QCIF for camcorder capability
- Video decode at 15 fps at QCIF resolution, streaming or offline

gpsOne™

- Integrated gpsOne processing
- Standalone gpsOne mode in which the handset acts as a GPS receiver

CMX™ (MIDI and still image, animation, text, LED/vibrate support)

- 72 simultaneous polyphonic tones
- 44 kHz sampling rate
- 512 kB wave table
- Support of universal file formats
  - ❑ Standard MIDI Format (SMF)
  - ❑ SP-MIDI
  - ❑ SMAF® Audio playback (MA-2, MA-3, MA-5)
  - ❑ XMF/DLS
  - ❑ MFil (requires Docomo license)
- PNG decoder
- Pitch bend range support
- LED/vibrate support
- Scalable Vector Graphics (SVG- Tiny 1.1 + SVG Tiny 1.2)
- MLZ decoder
- Integrated PNG/SAF A.T.

3. TECHNICAL BRIEF

Features	MSM6260
Modem	Tri-band WCDMA Quad-band GSM/GPRS/EDGE HEDGE 3.6 Mbps HSDPA GPS DTM
Processor	ARM926 EJ-S – 270 MHz AHB – 90 MHz for 3.6 Mbps HSDPA ARM926 EJ-S – 225 MHz AHB – 75 MHz for no HSDPA ARM926 EJ-S – 122 MHz AHB – 61 MHz for no HSDPA and limited multimedia QDSP – 100 MHz
Process technology	65 nm
Supported RF platforms (see Description of RF configurations for platform definition)	Platform B (RTR6275+ RFR6275) Platform E (RTR6275+ RFR6275) Platform F (RTR6285 + receive diversity)
HSDPA	3.6 Mbps, category 5/6
Enhanced antenna	SAIC, equalizer, receive diversity
Memory configuration	8/16-bit NAND and 32-bit SDRAM (See Note 2)
Broadcast interface	Not supported
Power management IC	PMIC 6650-2
USB	3-wire USB-OTG
MDDI	Supported
Qcamera (camera interface) Viewfinder frame rate	Up to 3.0 M pixel support 30 fps @ QCIF
Qcamcorder (recording performance)	15 fps @ QCIF
QTv (video decode)	15 fps QCIF streaming, 15 fps QCIF playback
Audio / video decoders	MP3, AAC, AAC+, ADPCM, MPEG4, H.263, H.264, Real networks, Windows media, WB-AMR/+
Qvideophone (video telephony)	15 fps @ QCIF
LCD HW interface	Up to 24 bpp
Boot mode	Trusted boot mode only

Table 1-1 Summary of MSM6260 device features

3.8.10 Serial Bus Interface(SBI)

The MSM6260 device's SSBI is designed specifically to be a quick, low pin count control protocol for QUALCOMM's RTR6275, RFR6275 and PM6650 ASICs. Using the SSBI, the RTR6275, RFR6275, and PM6650 devices can be configured for different operating modes and for minimum power consumption, extending battery life in Standby mode. The SSBI also controls DC baseband offset errors.

3.8.11 Wideband CODEC

The MSM6260 device integrates a wideband voice/audio CODEC into the mobile station modem (MSM). The CODEC supports two differential microphone inputs, one differential earphone output, one single-ended earphone output, and a differential analog auxiliary interface. The CODEC integrates the microphone and earphone amplifiers into the MSM6260 device, reducing the external component count to just a few passive components. The microphone (Tx) audio path consists of a two-stage amplifier with the gain of the second stage set interally. The Rx/Tx paths are designed to meet the ITU-G.712 requirements for digital transmission systems.

3.8.12 Vocoder Subsystem

The MSM6260 device's QDSP4000 supports AMR,FR,EFR and HR. In addition, the QDSP4000 has modules to support the following audio functions: DTMF tone generation, DTMF tone detection, Tx/Rx volume controls, Tx/Rx automatic gain control (AGC), Rx Automatic Volume Control (AVC), EarSeal Echo Canceller (ESEC), Acoustic Echo Canceller (AEC), Noise Suppression (NS), and programmable, 13-tap, Type-I, FIR, Tx/Rx compensation filters. The MSM6260 device's integrated ARM9TDMI processor downloads the firmware into the QDSP4000 and configures QDSP4000 to support the desired functionality.

3.8.13 ARM Microprocessor subsystem

The MSM6260 device uses an embedded ARM926EJ-S microprocessor. This microprocessor, through the system software, controls most of the functionality for the MSM device, including control of the external peripherals such as the keypad, LCD, RAM, ROM, and EEPROM devices. Through a generic single serial bus interface (SSBI) the ARM926EJ-S configures and controls the functionality of the RFR6275, RTR6275, and PM6650 devices.

3.8.14 Mode Select and JTAG Interfaces

The mode pins to the MSM6260 device determine the overall operating mode of the ASIC. The options under the control of the mode inputs are Native mode, which is the normal subscriber unit operation, ETM mode, which enables the built-in trace mode, and test mode for factory testing. The MSM6260 device meets the intent of the ANSI/IEEE 1149.1A-1993 feature list. The JTAG interface can be used to test digital interconnects between devices within the mobile station during manufacture.

3.8.15 General-Purpose Input/Output Interface

The MSM6260 device has general-purpose bidirectional input/output pins. Some of the GPIO pins have alternate functions supported on them. The alternate functions include USB interface, additional RAM, ROM, general-purpose chip selects, parallel LCD interface, and a UART interface. The function of these pins is documented in the various software releases.

3.8.16 UART

The MSM6260 device employs three UARTs. UART1 has dedicated pins while UART2 and UART3 share multiplexed pins.
■ UART1 for data
■ UART2 (can be used for USIM interface)
■ UART3 for data

3.8.17 USB

The MSM6260 device integrates a universal serial bus (USB) controller that supports both unidirectional and bidirectional transceiver interfaces. The USB controller acts as a USB peripheral communicating with the USB host.

3.9 Power Block

3.9.1 General

MSM6280, included RF, is fully covered by PM6650(Qualcomm PMIC). PM6650 cover the power of MSM6280, MSM memory, RF block, Bluetooth, Micro SD, USIM and TCXO.
Major power components are :

PM6650(U401) : Phone power supply

AAT3157ITP(U401) : LCD Backlight charge pump

PM6650(U401) : LCD LDO

PM6650(U401) : Camera dual LDO

3.9.2 PM6650

The PM6650 device (Figure 1-1) integrates all wireless handset power management. The power management portion accepts power from all the most common sources - battery, external charger, adapter, coin cell back-up - and generates all the regulated voltages needed to power the appropriate handset electronics. It monitors and controls the power sources, detecting which sources are applied, verifying that they are within acceptable operational limits, and coordinates battery and coin cell recharging while maintaining the handset electronics supply voltages. Eight programmable output voltages are generated using low dropout voltage regulators, all derived from a common trimmed voltage reference.
A dedicated controller manages the TCXO warm-up and signal buffering, and key parameters (under-voltage lockout and crystal oscillator signal presence) are monitored to protect against detrimental conditions.
MSM device controls and statuses the PM6650 IC using Single Serial Bus Interface (SSBI) supplemented by an Interrupt Manager for time-critical information. Another dedicated IC Interface circuit monitors multiple trigger events and controls the power-on sequence.

3. TECHNICAL BRIEF
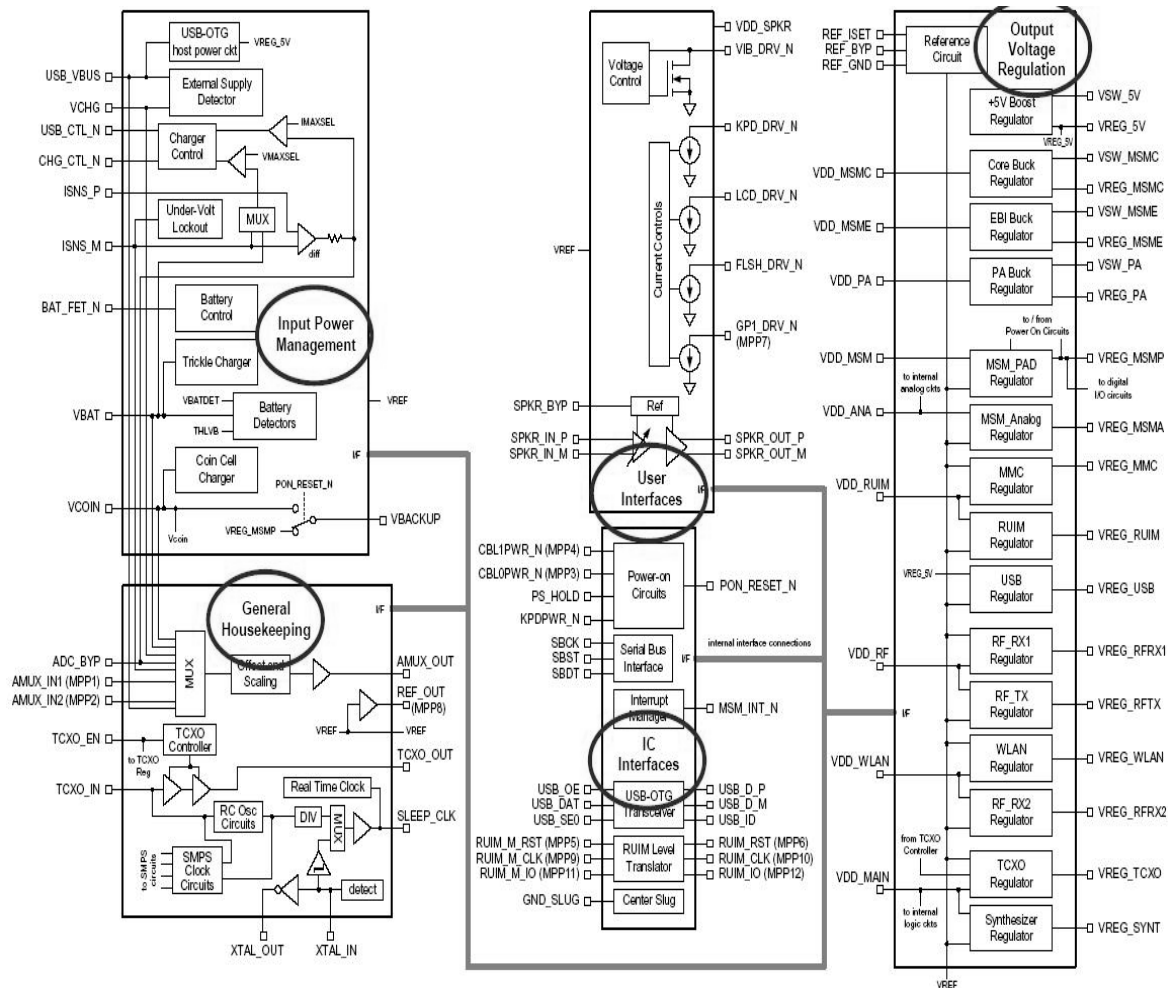
Figure. PM6650 Functional Block Diagram

3.9.3 Charging control

A programmable charging block in PM6650 is used for battery charging. It is possible to set limits for the charging current. The external supply typically connects directly to pin (VCHG). The voltage on this pin (VCHG) is monitored by detection circuitry to ascertain whether a valid external supply is applied or not. For additional accuracy or to capture variations over time, this voltage is routed internally to the housekeeping ADC via the analog multiplexer. PM6650 circuits monitor voltages at VCHARGER and ICHARGE pins to determine which supply should be used and when to switch between the two supplies. These pins are connected to the Source (or emitter) and Drain (or collector) contacts of the pass transistor respectively.

CU515 Battery Bar Display(Stand By Condition)
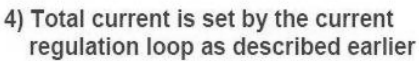
3. TECHNICAL BRIEF

Trickle Charging

Trickle Charging of the main battery, enabled through SBI control and powered from V_{DD}, is provided by the PM6650 IC, The trickle charger is on-chip programmable current source that supplies current from V_{DD} to pin (VBAT). Trickle charging can be used for lithium-ion and nickel-based batteries, with its performance specified below (3.2V). The charging current is set to 80mA.

Parameter	Min	Typ	Max	Unit
Trickle Current	60	80	100	mA

1) Pass transistor (not shown) is turned ON

2) Battery transistor is turned OFF

3) On-chip programmable current source runs off VDD

4) Current is set by software: 0 (off) to 80 mA; 8 states

5) Charging current (blue) flows out pin 6 (VBAT)

6) Battery voltage is routed to MSM
   ; MSM HKADC measures VBAT

7) Trickle charging is finished when the battery reaches the desired threshold

"Auto Trickle Charge" feature

When this feature is enabled VBAT is checked as soon as a valid external supply is detected.

- If VBAT < 1V:
  Faulty battery, too low to chg; PM6650 powers up normally

- If 1V < VBAT < 3V:
  Battery good but depleted; trickle charging auto-started. Special algorithm followed.

- If VBAT > 3V:
  Normal PM6650 power-up

Constant Current Charging

The PM6650 IC supports constant current charging of the main battery by controlling the charger pass transistor and the battery transistor. The constant current charging continues until the battery reaches its target voltage, 4.2V.

Constant Voltage Charging

Constant voltage charging begins when the battery voltage reaches a target voltage, 4.2V. The end of constant voltage charging is commonly detected 10% of the full charging current (110mA)

· Charging Method : CC & CV (Constant Current & Constant Voltage)
· Maximum Charging Voltage : 4.2V
· Maximum Charging Current : 600mA
· Nominal Battery Capacity : 1000 mAh
· Charger Voltage : 5.1V
· Charging time : Max 3h (Except time trickle charging)
· Full charge indication current (icon stop current) : 110mA
· Low battery POP UP : Idle - 3.493V, Dedicated(GSM/WCDMA) - 3.617V
· Low battery alarm interval : Idle - 3 min, Dedicated - 1min
· Cut-off voltage : 3.28V

3.10 External memory interface

A. MSM6260

The MSM6260 device was designed to provide two distinct memory interfaces. EBI1 was targeted for supporting high speed synchronous memory devices. EBI2 was targeted towards supporting slower asynchronous devices such as LCD, NAND flash, SRAM, etc.

· EBI1 Features

- 16 bit static and dynamic memory interface

- 32 bit dynamic memory interface

- 24 bits of address for static memory devices which can support up to 32MBytes on each chip select

- Synchronous burst memories supported (burst NOR, burst PSRAM)

- Synchronous DRAM memories supported

- Byte addressable memory supporting 8 bit, 16 bit and 32 bit accesses

- Pseudo SRAM (PSRAM) memory support

· EBI2 Features

- Support for asynchronous FLASH and SRAM(16bit & 8bit)

- Interface support for byte addressable 16bit devices(UB_N & LB_N signals)

- 2Mbytes of memory per chip select

- Support for 8 bit/16bit wide NAND flash

- Support for parallel LCD interfaces, port mapped of memory mapped(18 or 16 bit)

· 1Gb NAND(16bit) flash memory + 512Mb SDRAM (32bit)

· 1-CS(Chip Select) are used

Interface Spec				
Device	Part Name	Maker	Read Access Time	Write Access Time
FLASH	TY9000A800K0GG	Toshiba	50 ns	50 ns
SDRAM	TY9000A800K0GG	Toshiba	15 ns	15 ns

Table#1. External memory interface for CU515

3.11 H/W Sub System

3.11.1 RF Interface

A. RTR6275(WCDMA_Tx, GSM_Tx/Rx)

MSM6260 controls RF part(RTR6275) using these signals.

· SBST : SSBI I/F signals for control Sub-chipset

· PA_ON1, PA_ON2 : Power AMP on RF part

· RX0_I/Q_M/P,TX_I/Q_M/P: I/Q for T/Rx of RF

· TX_AGC_ADJ : control the gain of the Tx signal prior to the power amplifier
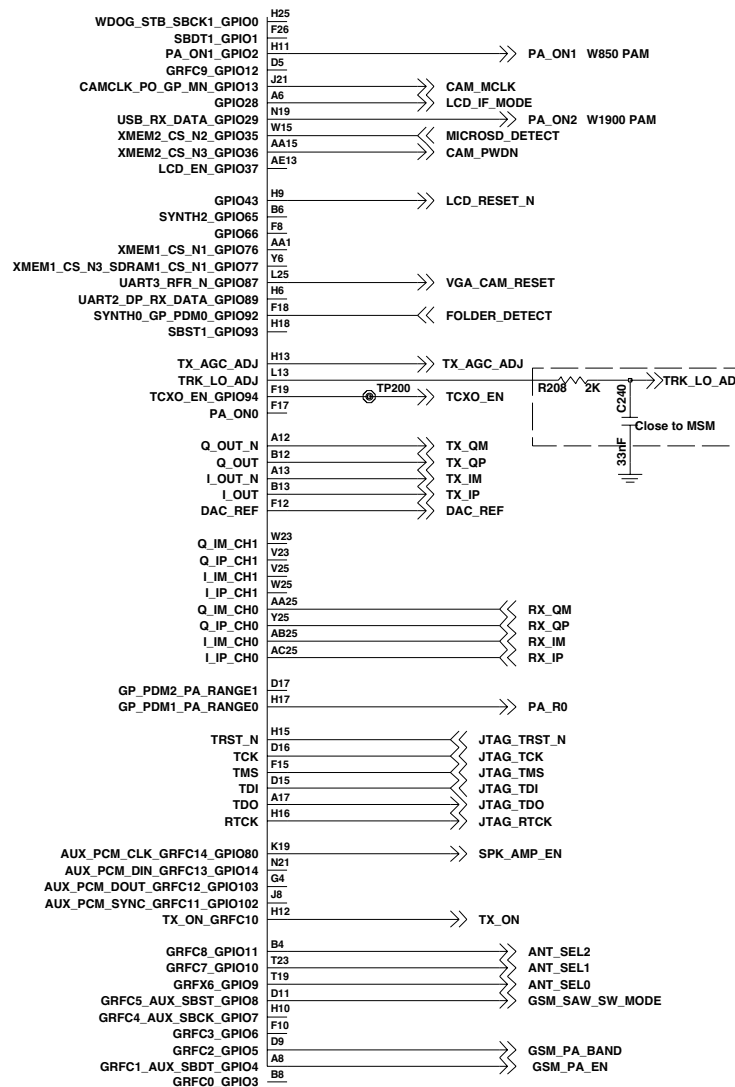
Figure. Schematic of RF Interface of MSM6260

3. TECHNICAL BRIEF

B. RFR6275(WCDMA_Rx)

· SBDT: SSBI I/F signals for control Sub-chipset

· RX0_I/Q_M/P : I/Q for Rx of RF

C. the others

· TRK_LO_ADJ : TCXO(19.2M) Control

· PA_ON1 : WCDMA(850) TX Power Amp Enable

· PA_ON2: WCDMA(1900) TX Power Amp Enable

· ANT_SEL[0-3] : Ant Switch Module Mode Selection(WCDMA,GSM Tx/Rx,DCS-PCS Tx/Rx)

· GSM_PA_BAND : GSM/DCS-PCS Band Selection of Power Amp

· GSM_PA_RAMP : Power Amp Gain Control of APC_IC

· GSM_PA_EN : Power Amp Gain Control Enable of APC_IC

· GSM_SAW_SW_MODE: GSM SAW Filter Switch

3.11.2 MSM Sub System

3.11.2.1 USIM Interface

SIM interface scheme is shown in Figure.
And, there control signals are followed

・USIM_CLK : USIM Clock

・USIM_Reset : USIM Reset

・USIM_Data : USIM Data T/Rx
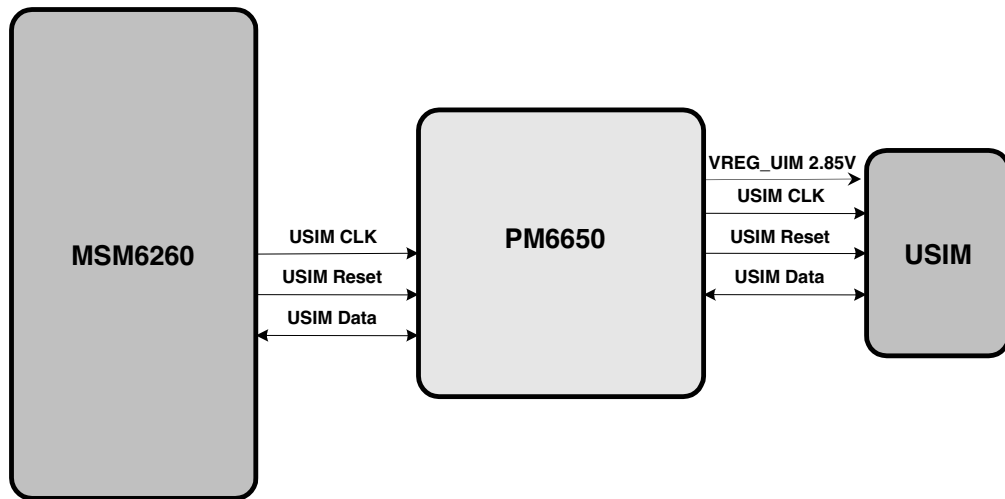
Figure. SIM Interface

3.11.2.2 UART Interface

UART signals are connected to MSM GPIO through IO connector with 115200 bps speed.

GPIO_Map	Name	Note
GPIO_96	UART_RXD	Data_Rx
GPIO_95	UART_TXD	Data_Tx

Table. UART Interface

3. TECHNICAL BRIEF

3.11.2.3 USB

The MSM6260 device contains a Universal Serial Bus (USB) interface to provide an efficient interconnect between the mobile phone and a personal computer (PC). The USB interface of the MSM6260 was designed to comply with the definition of a peripheral as specified in USB Specification, Revision 1.1. Therefore, by definition, the USB interface is also compliant as a peripheral with the USB Specification, Revision 2.0. The USB Specification Revision 1.1 defines two speeds of operation, namely low-speed (1.5 Mbps) and full-speed (12 Mbps), both of which are supported by the MSM6260.

Name	Note
USB_DAT	Data to/from MSM
USB_SE0	Data to/from MSM
USB_OE_N	Out-Put Enable of Transceiver
USB_VBUS	USB_Power From Host(PC)
USB_D+	USB Data+ to Host
USB_D-	USB Data- to Host

Table. USB Signal Interface
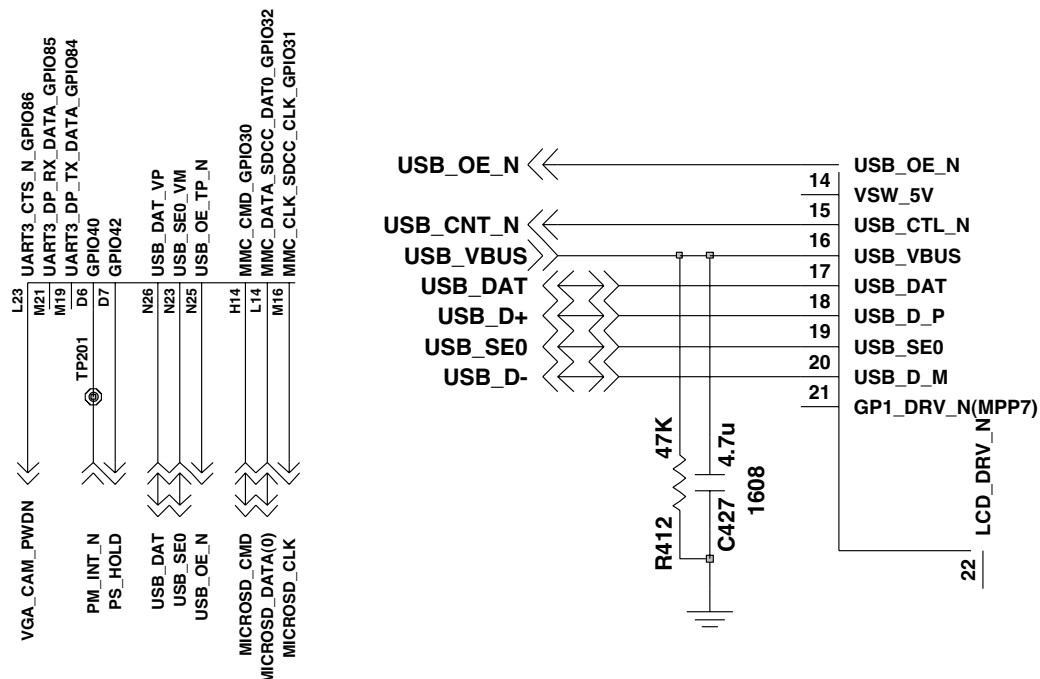
Figure. Schematic of USB block(MSM6260Side & PM6650 Side)

3.11.3 HKADC(House Keeping ADC)

The MSM6260 device has an on-chip 8-bit analog-to-digital converter (HKADC) which is tended to digitize DC signals corresponding to analog parameters such as battery voltage, temperature, and RF power levels. The MSM6260 device has six analog input pins which are multiplexed to the input of the internal HKADC.
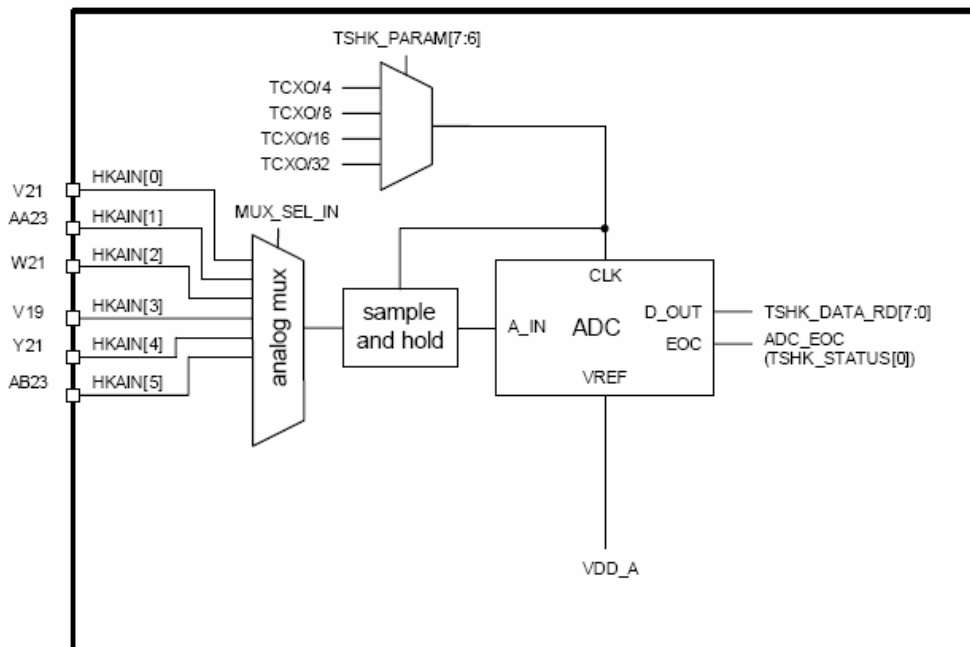
Figure. MSM6260HKADC Block diagram

Channel	Signal	Note
HKADC0	AMUX_OUT	RF PAM Temperature Check
HKADC1	VBATT_SENSE	Battery voltage level
HKADC2	No use	
HKADC3	TTY_ADC_DET	Ear jack Detection for TTY
HKADC4	PCB_Rev_ADC	PCB Version Check
HKADC5	VBATT_TEMP	Battery Temperature Check

Table. HKADC channel table

3. TECHNICAL BRIEF

3.11.4 Key Pad

There are 24 buttons, 4 side keys in Figure. Shows the Keypad circuit. 'END' Key is connected PM_ON_SW_N to PMIC(PM6650).

	COL(0)	COL(1)	COL(2)	COL(3)	COL(4)	COL(5)
ROW0			Multi	CLR	MENU	Side(up)
ROW(1)	1	2	3	Left	Up	Side(down)
ROW(2)	4	5	6	OK	Right	PTT
ROW(3)	7	8	9	SEND	SEARCH	
ROW(4)	*	0	#	Down	BACK	

Table. Key Matrix Mapping Table

Figure. Keypad Circuit

ON_SW

SPK_EN

VOL
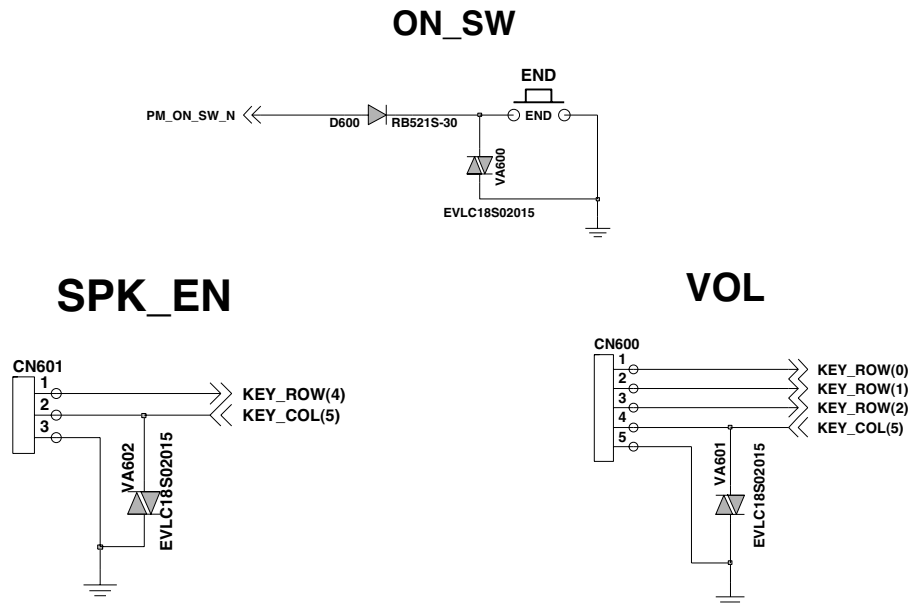
Figure. Keypad Circuit (On switch, Side KEY 4EA)

3.11.5 Camera Interface

CU515 Installed a 1.3M Pixel SXGA Camera.
Below figure shows the camera board to board connector and camera I/F signal.

CN103
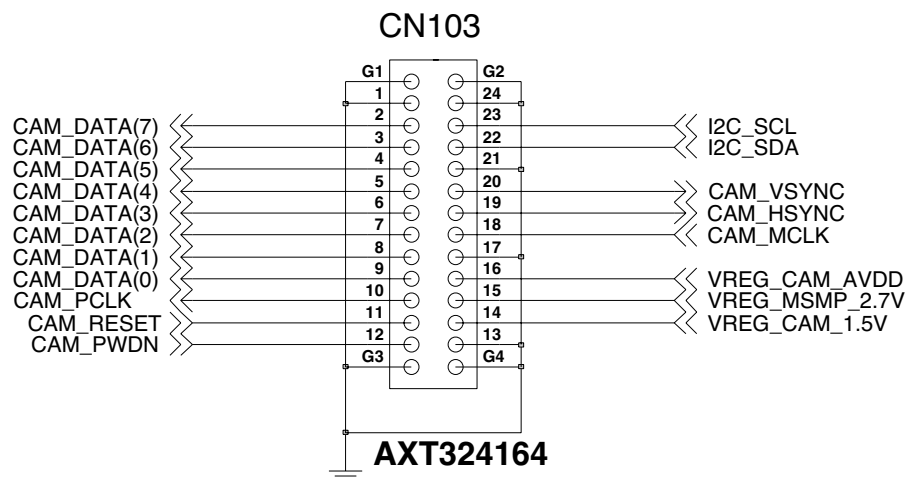
FPCB_TO_CAMERA CONNECTOR

Figure. VGA Camera and Slide FPCB Board to Board Connector

3. TECHNICAL BRIEF

The Camera module is connected to LCD FPCB with 24pin Board to Board connector. Its interface is dedicated camera interface port in MSM6260. The camera port supply 24MHz master clock to camera module and receive 48MHz pixel clock (15fps), vertical sync signal, horizontal sync signal, reset signal and 8bits data from camera module. The camera module is controlled by I2C port from MSM6260.

No	Name	Port	Note
1	GND	GND	GND
2	CAM_DATA(7)	O	Camera data
3	CAM_DATA(6)	O	Camera data
4	CAM_DATA(5)	O	Camera data
5	CAM_DATA(4)	O	Camera data
6	CAM_DATA(3)	O	Camera data
7	CAM_DATA(2)	O	Camera data
8	CAM_DATA(1)	O	Camera data
9	CAM_DATA(0)	O	Camera data
10	CAM_PCLK	O	Camera pixel clock
11	CAM_RESET	I	Camera reset
12	CAM_PWDN	I	Camera power down(Enable)
13	GND	GND	GND
14	VREG_CAM_1.5V	I	Camera core power
15	VREG_MSMP_2.7V	I	Camera I/O power
16	VREG_CAM_AVDD	I	Camera Analog power
17	GND	GND	GND
18	CAM_MCLK	I	Main clock
19	CAM_HSYNC	O	Horizontal Sync
20	CAM_VSYNC	O	Vertical Synch
21	GND	GND	GND
22	I2C_SDA	I	I2C data
23	I2C_CLK	I	I2C clock
24	GND	GND	GND

Table. Interface between Camera Module and LCD FPCB (in camera module)

3.11.6 Folder ON/OFF Operation

There is a magnet to detect the Folder status, opened or closed.

If a magnet is close to the hall-effect switch, the voltage at pin OUT of U600 goes to 0V. Otherwise, 2.7V.

This folder signal is delivered to MSM6260 GPIO92.

FOLDER_DETECT
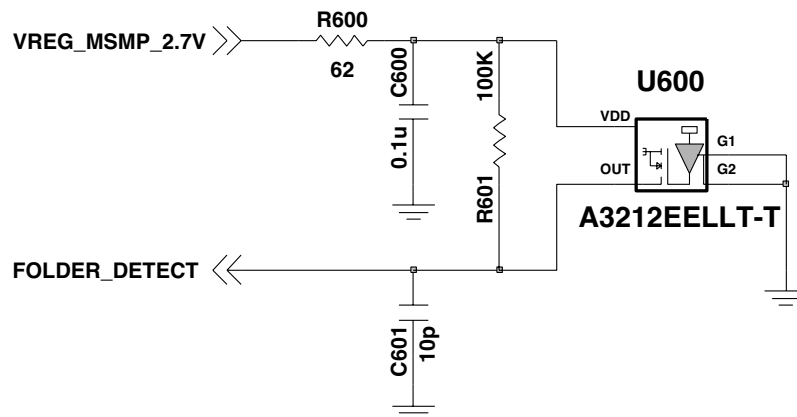
Figure. Schematic of Folder ON/OFF detection circuit

3.11.7 Keypad Light

There are 16 White LEDs in Main board backlight circuit, which are driven by KPD_DRV_N line from PM6650.

There are 7 Orange LEDs in Touch FPCB, which are driven by KEY_LED_DRV_N line from PM6650.

KEY_BACK_LIGHT LED(16EA)
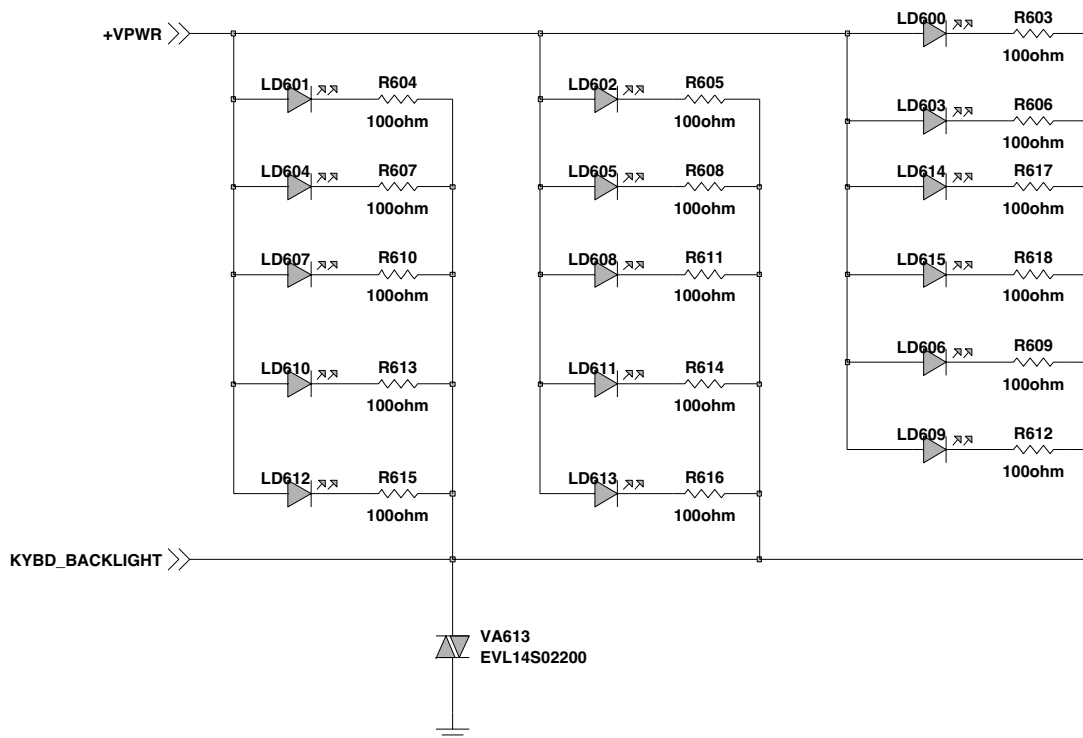
Figure. Keypad Backlight Circuit

3.11.8 LCD Module (NM200CM2A : TOVIS)

- The NM220CT2 model is a Color TFT Main and MONO Sub LCD supplied by TOVIS. This main Module has a 2.0 inch diagonally measured active display area with 176(RGB)X220 resolution and sub Module has a 0.98 inch diagonally measured active display area with 96X64 resolution. In case of Main LCD, each pixel is divided into Red, Green and Blue sub-pixels and dots which are arranged in vertical stripes.

* Features

- Display mode(Main LCD) : Normally White, Transmissive TN mode 65K colors

- Display mode(Sub LCD) : Normally Black, Mono Transmissive TN mode 256 colors

- LCD Driver IC: LGDP4523(Main LCD,LGE), S6B0724(Sub LCD, Samsung)

- Driving Method : A-Si TFT Active Matrix

- 16 bit CPU interface Parallel

- 16 bit / 18 bit CPU interface Parallel
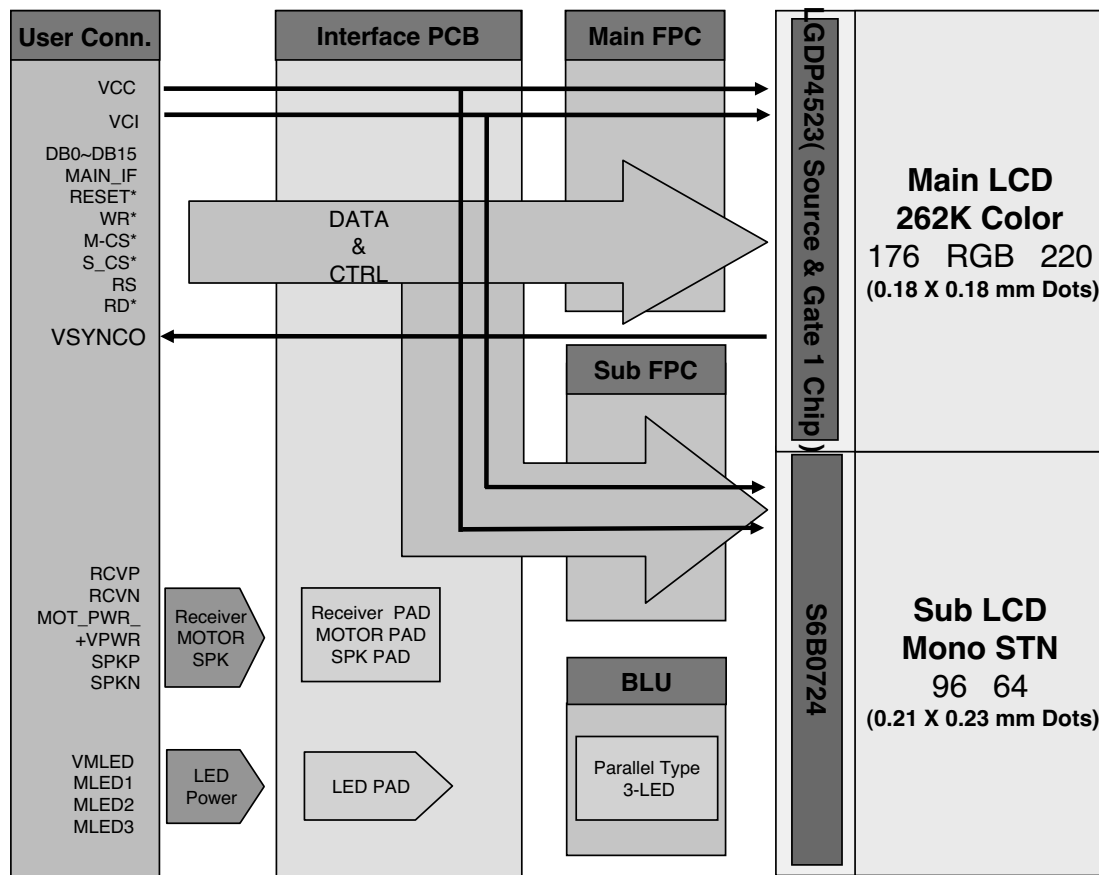
Figure. LCD Module Block Diagram

3.11.9 Display & LCD FPC Interface

LCD module is connected to LCD FPCB with 40 pins B TO B connector.

The LCD module is controlled by 16-bit EBI2 in MSM6260

FPCB_TO_LCD CONNECTOR

CN102

Left signal	Pin	Pin	Right signal
	G1		
	40	1	VSYNCOUT
EBI2_OE_N	39	2	EBI2_WE_N
LCD_MAKER_ID	38	3	LCD_CS_N
LCD_IF_MODE	37	4	LCD_RESET_N
LCD_ADS	36	5	SUB_LCD_CS_N
VREG_MSMP_2.7V	35	6	EBI2_DATA(0)
	34	7	EBI2_DATA(1)
EBI2_DATA(15)	33	8	EBI2_DATA(2)
EBI2_DATA(14)	32	9	EBI2_DATA(3)
EBI2_DATA(13)	31	10	EBI2_DATA(4)
EBI2_DATA(12)	30	11	EBI2_DATA(5)
EBI2_DATA(11)	29	12	EBI2_DATA(6)
EBI2_DATA(10)	28	13	EBI2_DATA(7)
EBI2_DATA(9)	27	14	WLED_PWR
EBI2_DATA(8)	26	15	WLED_1
RCV-	25	16	WLED_2
RCV+	24	17	WLED_3
	23	18	
SPK-	22	19	MOTOR_PWR-
SPK+	21	20	+VPWR
	G2		

AXK8L40125G

3.11.9.1 Audio Signal Processing & Interface

Audio signal processing is divided uplink path and downlink path.

The uplink path amplifies the audio signal from MIC and converts this analog signal to digital signal and then transmits it to DBB Chip (MSM6260).

This transmitted signal is reformed to fit in GSM & WCDMA frame format and delivered to RF Chipset.

The downlink path amplifies the signal from DBB chip (MSM6260) and outputs it to receiver (or speaker).

The receive path can be directed to either one of two earphone amplifiers or the auxiliary output.

The outputs earphone1 (EAR1OP, EAR1ON) and auxiliary out (AUXOP, AUXON) are differential outputs. Earphone2 (EAR2/EAR3) is a single-ended output stage designed to drive a headset speaker.

The microphone interface consists of two differential microphone inputs, one differential auxiliary input and a two-stage audio amplifier.
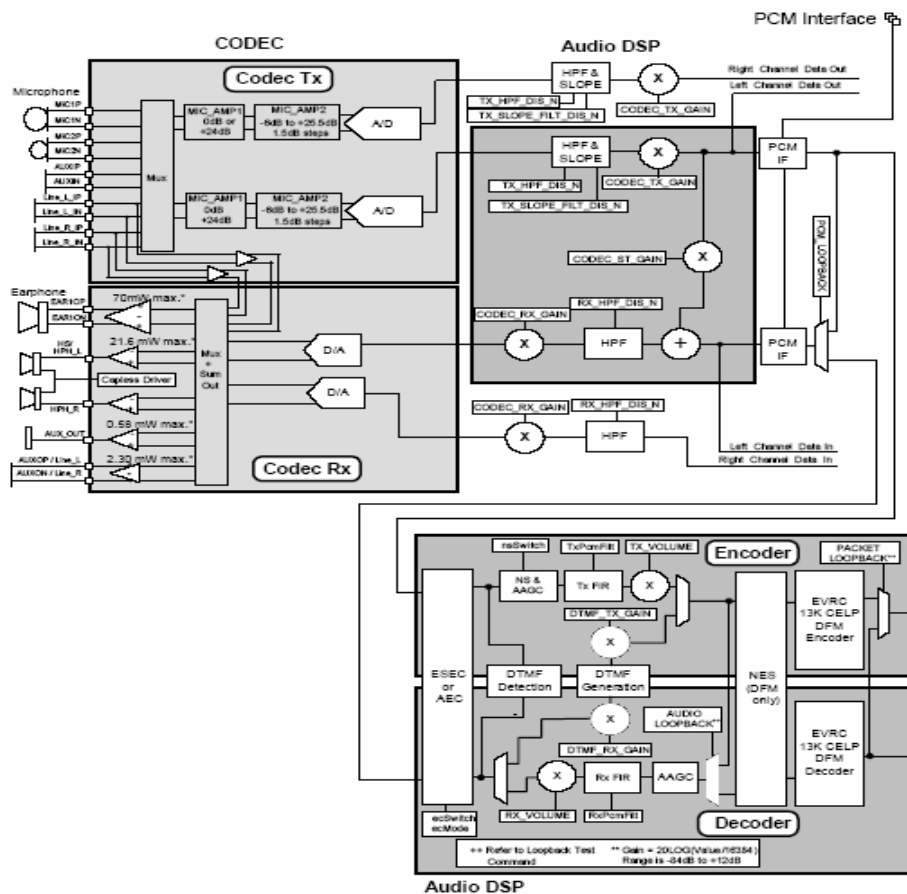
Figure. Audio Interface Detailed Diagram(MSM6260)

MSM6260 CODEC pins
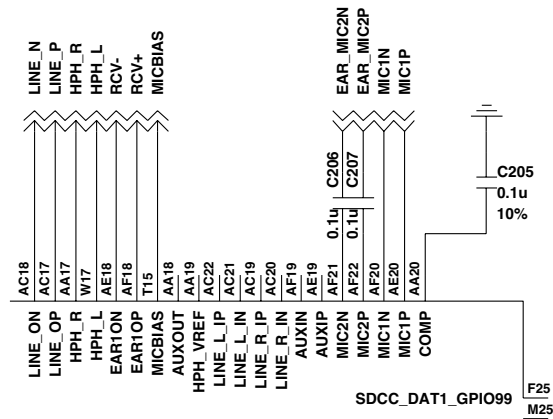
TTY DETECT

MIC

Figure . Audio part schematics

Speaker AMP

TPA2005D1ZQYR
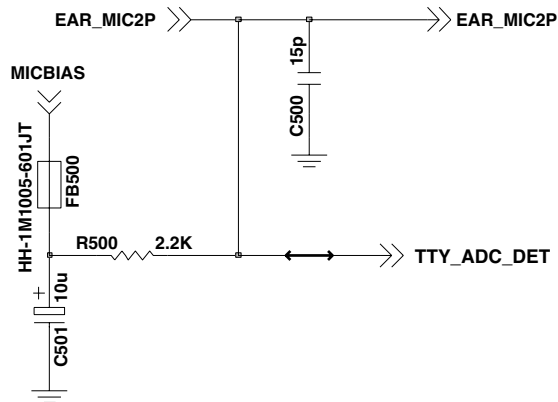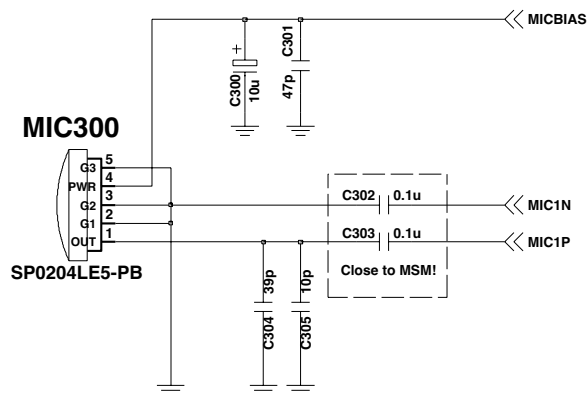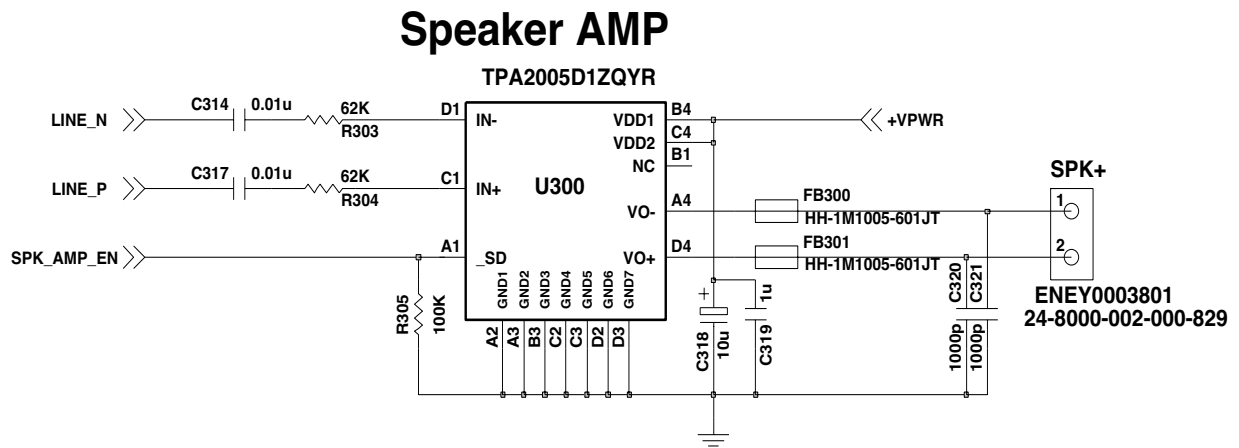
Figure . Audio part schematics

3. TECHNICAL BRIEF

3.11.9.2 Audio Mode

There are three audio modes (Voice call, speaker phone, MIDI/MP3).

MODE	Device	Description
Voice Call	Receiver Mode	Receiver Voice Call
	Loud Mode	Speaker Phone
	Headset	Headset Voice Call
Speaker phone	Loud Mode	Speaker Phone
MIDI	Loud Mode	Speaker MIDI Bell
	Headset	Headset MIDI Bell
MP3	Loud Mode	Speaker MP3
	Headset	Headset MP3
PTT	Receiver Mode	Receiver Voice Call
	Loud Mode	Speaker Phone
	Headset	Headset Voice Call
A2DP	Blue tooth	MP3

Table. Audio Mode

3.12 Main Features

3.12.1 LG-CU515 Main features

- Dual Clamshell Type

- WCDMA(850, 1900) + EDGE Quad(Class10)

- Color LCD(Main:65K TFT, 2.0', Sub : MSTN)

- 1.3M Camera

- 17 phi speaker

- Stereo Headset

- Speaker phone(in GSM and WCDMA)

- PTT with Voice Buffering (Kodiak v5.2)

- HAC (Hearing Aid Compatibility) Support

- 72 Poly Sound

- MP3/AAC decoder and play

- MPEG4 encoder/decoder and play/save

- JPEG en/decoder

- Supports Bluetooth, USB

- Support Micro SD Card

- 1,000 mAh (Li-Ion)

3.12.1.2 CU515 Main Component

Main board, Bottom

Bluetooth

Logic /Audio

RF

Main board, Top

Folder part
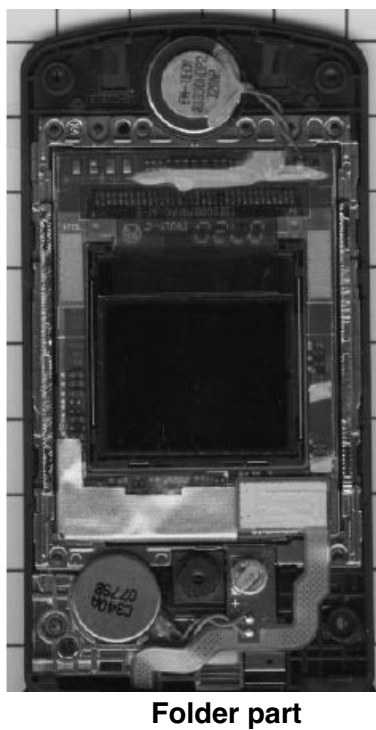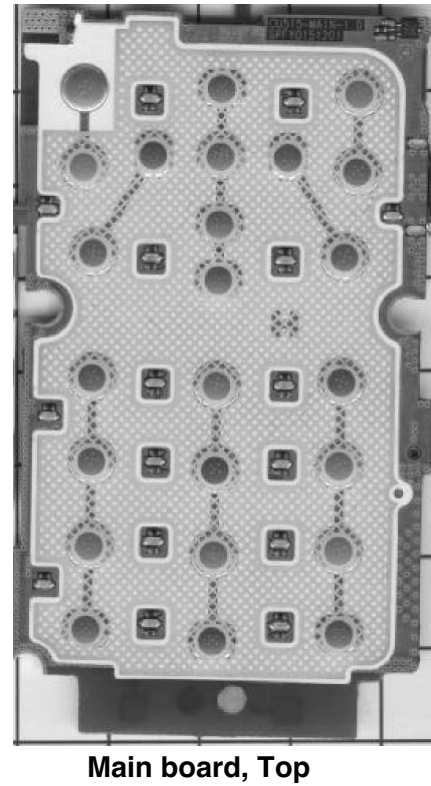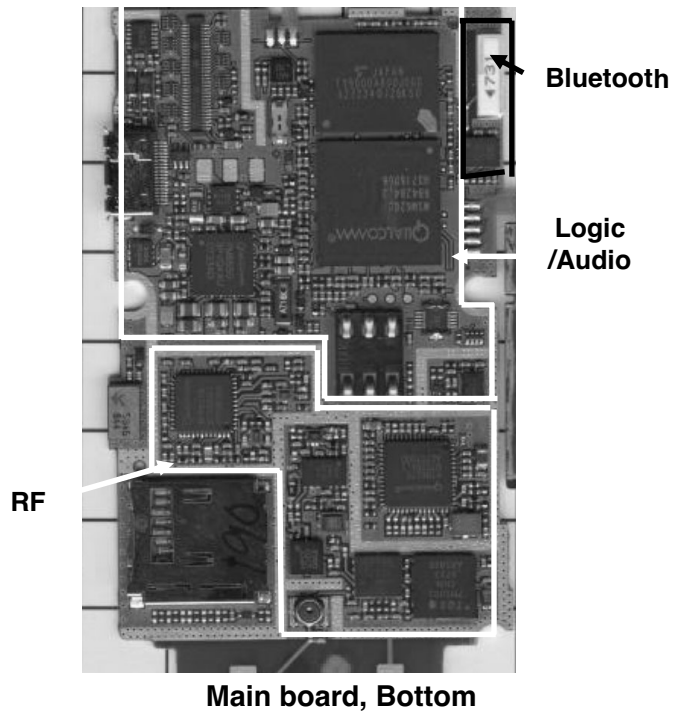
RF
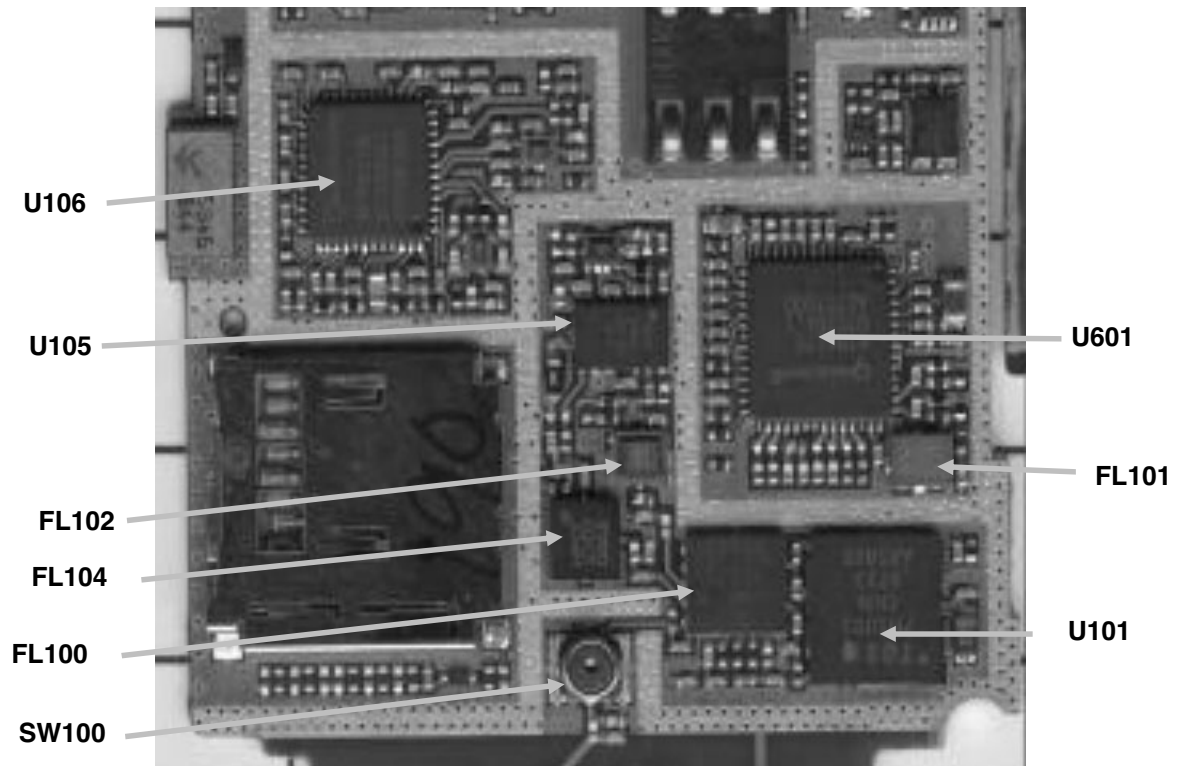
Reference	Description	Reference	Description
SW100	Ant. Switch module	U106	RFR6275
FL100	SP8T	FL102	W850 Duplex
U101	GSM PAM	FL104	W1900 Duplex
U101	GSM SAW	U105	WCDMA PAM
		U601	RTR6275

3. TECHNICAL BRIEF

Audio/logic
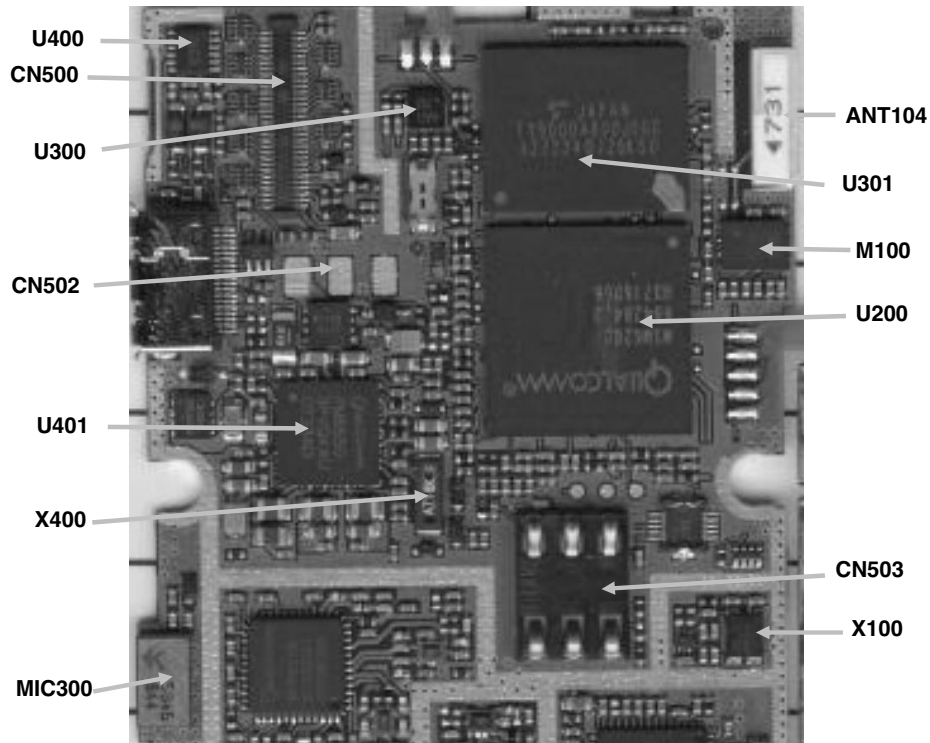
Reference	Description	Reference	Description
X100	TCXO	U401	PMIC
U200	MSM6260	U300	Speaker AMP
X400	OSC	CN503	USIM connector
U301	Memory	CN501	IO connector
M100	BT module	U400	Charge pump
ANT104	BT ANT	MIC300	MIC

4. TROUBLE SHOOTING

4.1 RF Component
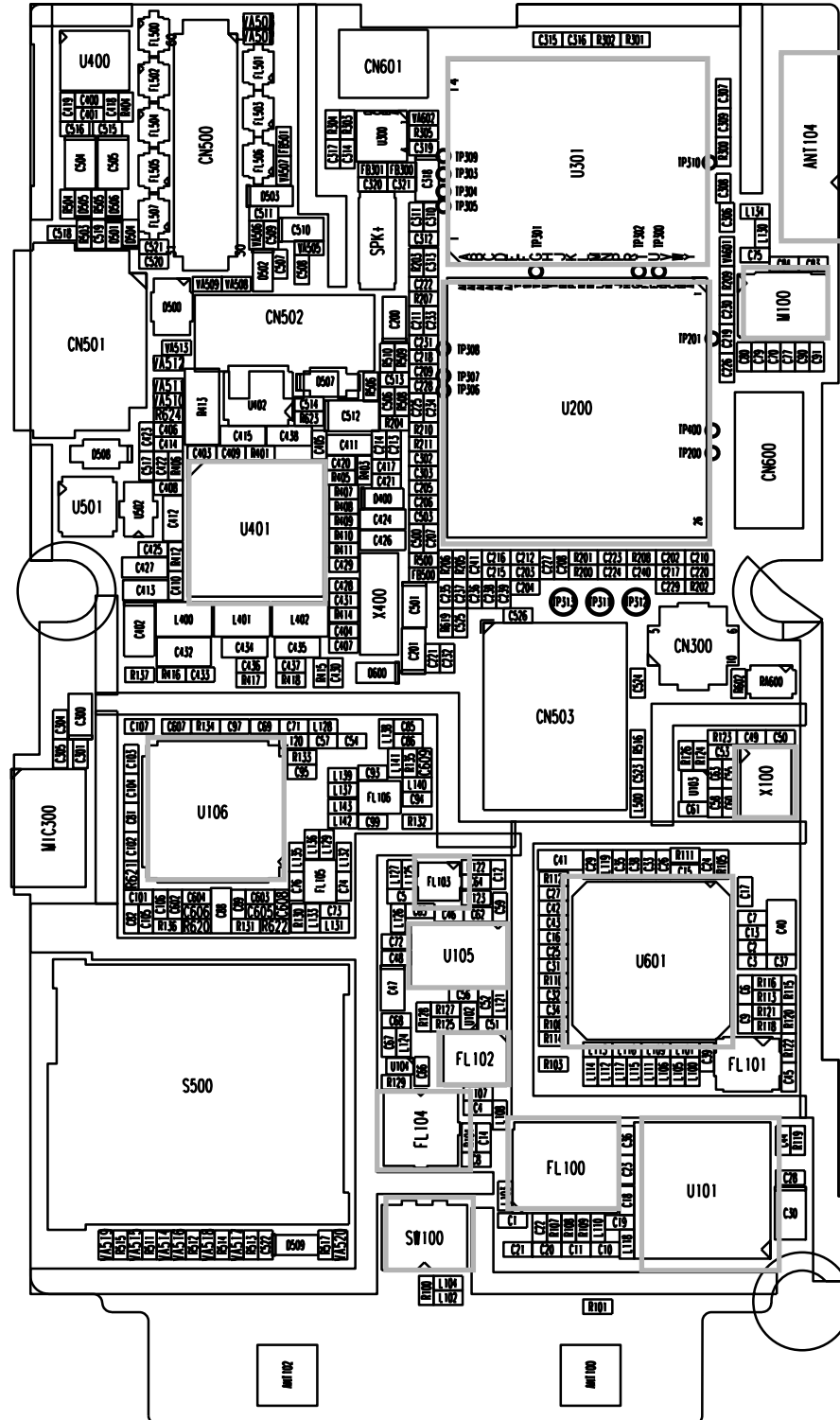
4. TROUBLE SHOOTING

Block Diagram Block	Ref. Name	TG-5001LH-19.2MHz	Function	Comment
Common	U200	MSM6260	Main Control	Main Chipset
	X400	FC-255(9PF,±20PPM)	Sleep Clock	32.768 kHz
	U401	PM6650-3P	Power Control	Power Supply
	U300	TPA2005D1ZQYR	Speaker AMP	AMP
	FL100	D2024	Switch	Band select
	U301	TY9000A800JOGG	Memory	1G/512M
	SW100	RF-800	Test Connector	Calibration, etc
	X100	TG-5001LH-19.2MHz	VCTCXO	19.2MHz
Bluetooth	M100	LBRQ-2B43A	Bluetooth RF Transceiver	Bluetooth TRX
	ANT104	AMAA903015LG12	Antenna	Bluetooth antenna
UMTS	U106	RFR6275	UMTS Receiver IC	RX
	U601	RTR6275-CHARTERED	UMTS/GSM Transceiver	TRX
	FL106	B7847	UMTS1900 RX SAW filter	RX
	FL105	B7838	UMTS850 RX SAW filter	RX
	FL102	B7637	UMTS 850 Duplexer	TRX
	FL104	ACMD-7402-TR1G	UMTS 1900 Duplexer	TRX
	U105	RF5144	UMTS dual PA	TX
	X100	MQW541A1G44	UMTS VCO	RX
	FL103	B9314	UMTS 1900/850 TX DUAL SAW Filter	TX
GSM	U105	AWT6321R	TX Dual PAM	TX
	FL101	LMSM32AA-533	GSM850/900 TX SAW Filter	TX

4.1.1 SIGNAL PATH_UMTS RF

❶	Common Tx/Rx
❷	UMTS 850 Tx/Rx
❸	UMTS 850 Tx
❹	UMTS 850 Rx
❺	UMTS 1900 Tx/Rx
❻	UMTS 1900 Tx
❼	Rx I/Q
❽	Tx I/Q
❾	LO

4.1.2 SIGNAL PATH_GSM RF

❶	Common Tx/Rx
❷	DCS Rx
❸	PCS Rx
❹	GSM 850 Rx
❺	GSM900 Rx
❻	DCS/PCS Tx
❼	GSM850/900 Tx
❽	Rx I/Q
❾	Tx I/Q
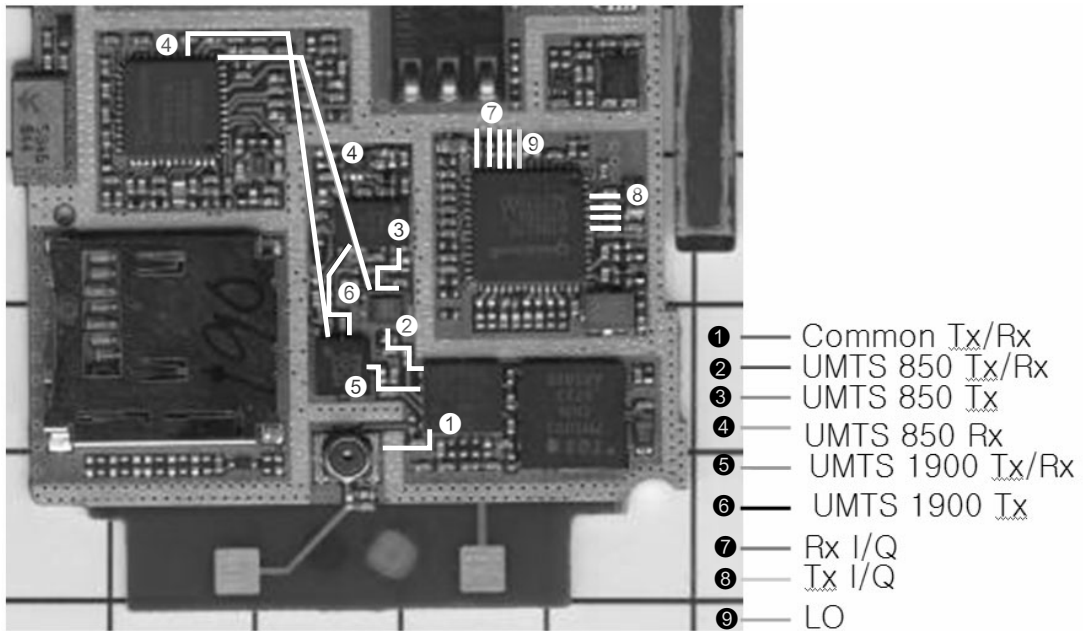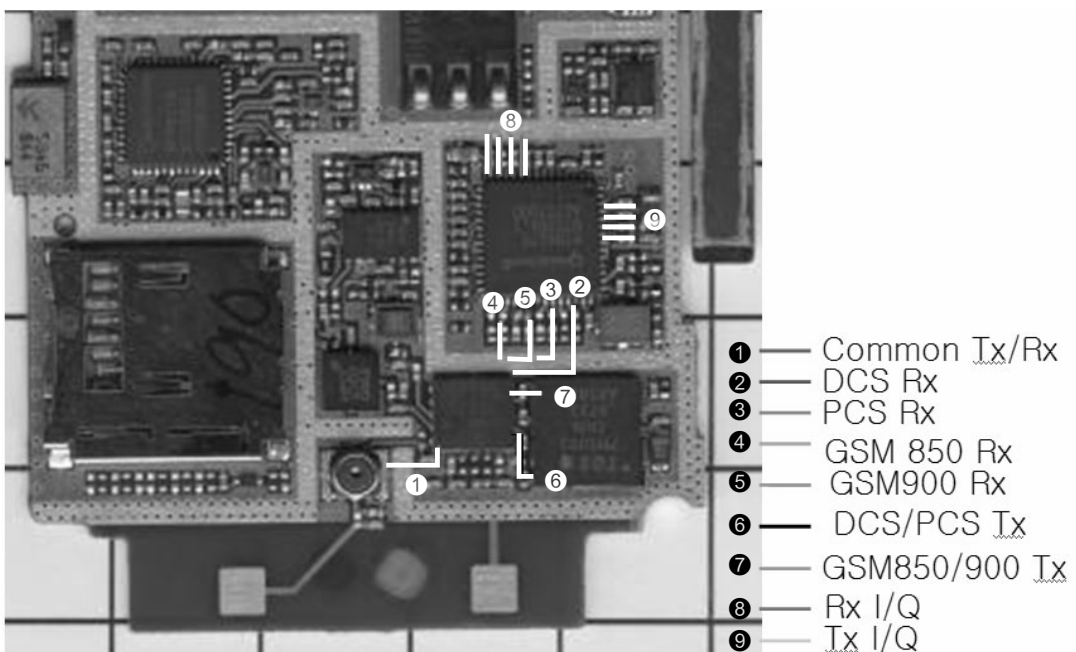
4.2 Checking VCXO Block

The reference frequency (19.2MHz) from X100 (TCXO) is used in UMTS TX part, GSM part and BB part.

Check 1. Crystal part

If you already check this crystal part, you can skip check 1.

Test Point (Crystal Part)

- 72 -

```
            ┌─────────────────────┐
            │     Check TP1       │
            │    VCC of VCXO      │
            └─────────────────────┘
                      │
                      ▼
                  ╱───────╲                    ┌──────────────────────┐
                 ╱  VCC ≥   ╲        NO         │  Check C414 of PMIC  │
                 ╲  2.8 V   ╱ ─────────────────▶│  (U401)              │
                  ╲───────╱                     └──────────────────────┘
                      │ YES
                      ▼
            ┌─────────────────────┐
            │     Check TP2       │
            │    TRK_LO_ADJ       │
            └─────────────────────┘
                      │
                      ▼
                  ╱───────╲                    ┌──────────────────────┐
                 ╱ 2V ≥     ╲       NO          │  Check R212 of MSM   │
                 ╲ Voltage  ╱ ─────────────────▶│  (U200)              │
                 ╲  ≥ 1V   ╱                    └──────────────────────┘
                  ╲───────╱
                      │ YES
                      ▼
            ┌─────────────────────┐
            │    Check TP3,4      │
            │  With Oscilloscope  │
            └─────────────────────┘
                      │
                      ▼
                  ╱───────╲                    ┌──────────────────────┐
                 ╱ 2V ≥     ╲       NO          │   Check soldering    │
                 ╲ Voltage  ╱ ─────────────────▶│   and components     │
                 ╲  ≥ 1V   ╱                    └──────────────────────┘
                  ╲───────╱
                      │ YES
                      ▼
            ┌─────────────────────┐
            │     VCXO is OK      │
            │   Check other part  │
            └─────────────────────┘
```
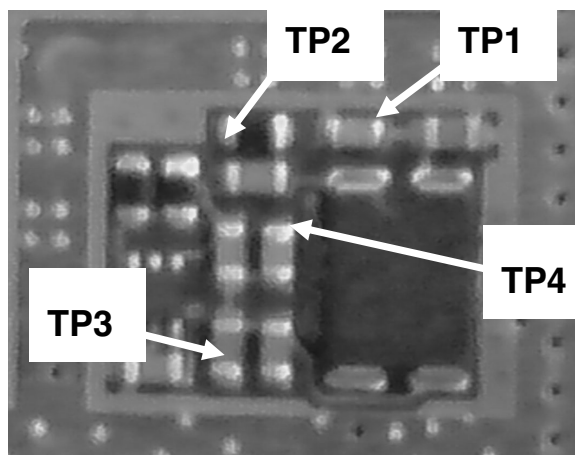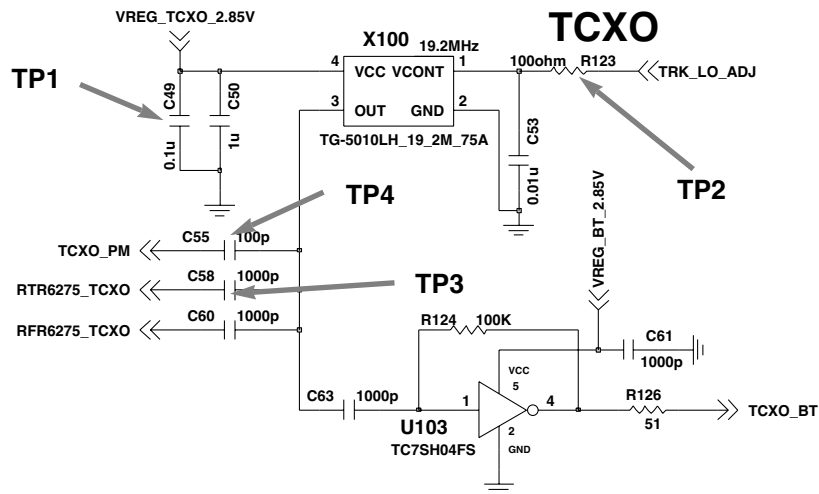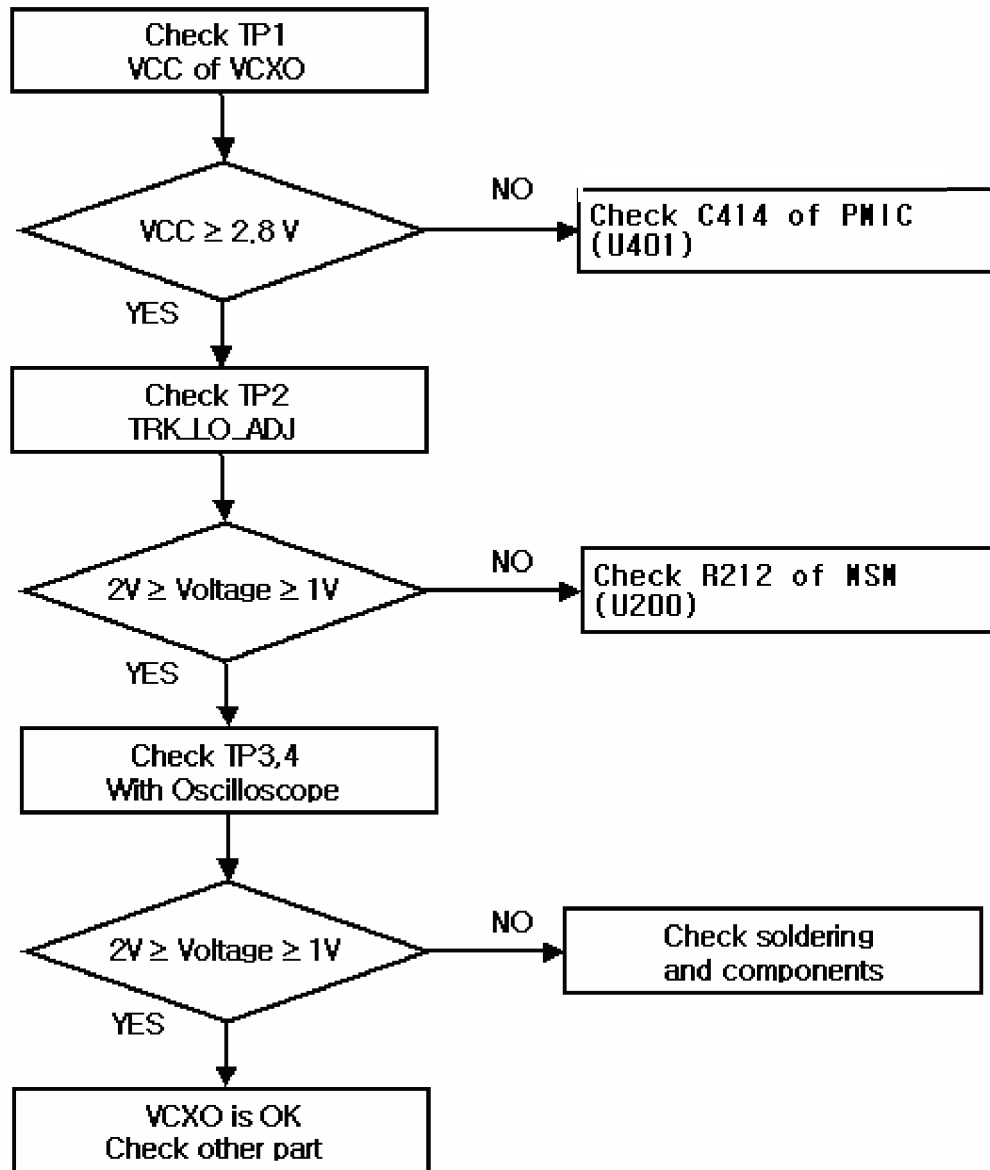
4.3 Checking Ant. SW Module Block
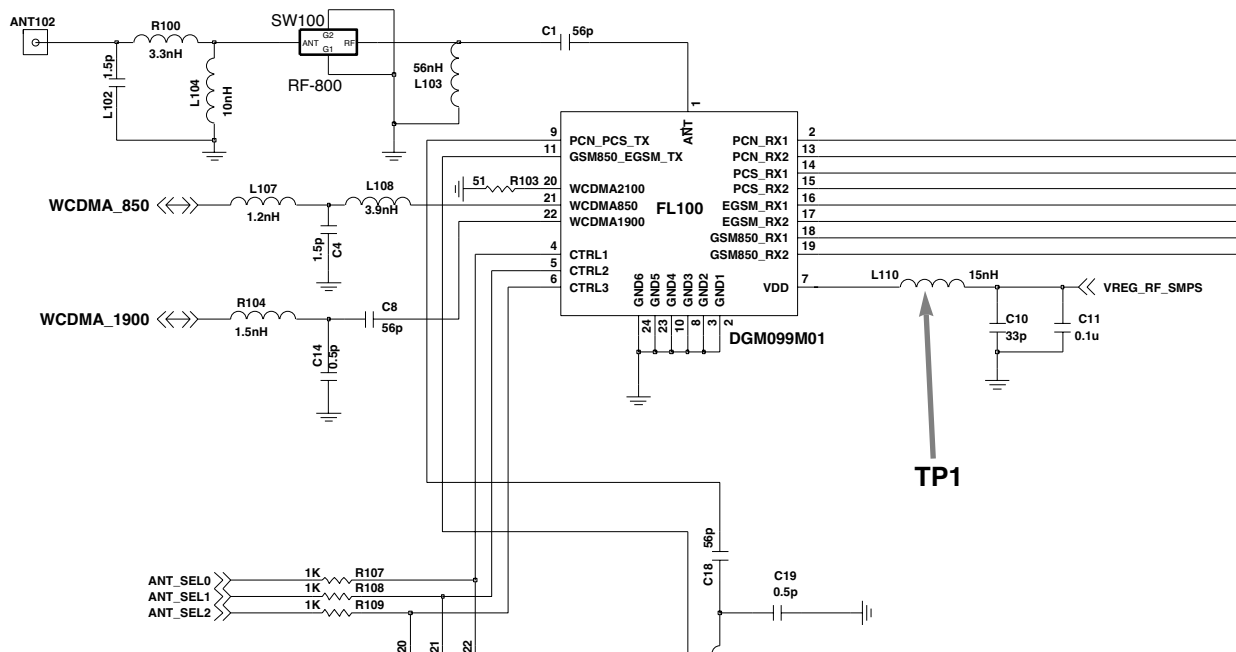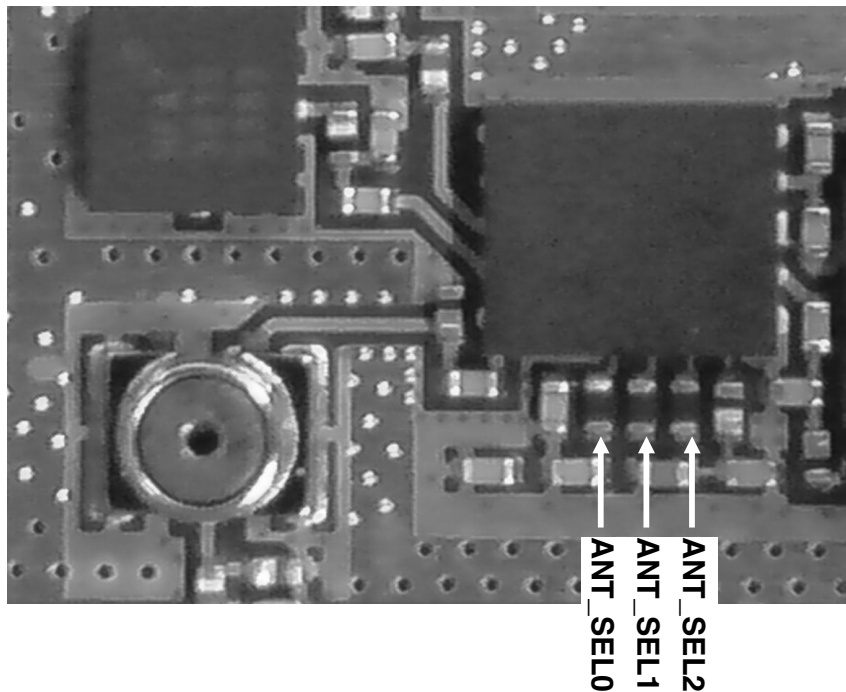
Schematic of the Antenna Switch Block

CONTROL LOGIC

Mode	Vc1	Vc2	Vc3	Vc4	Vdd
GSM850/900 Tx	1.8-3.0V	1.8-3.0V	0-0.2V	0-0.2V	2.4-3.0V
GSM1800/GSM1900 Tx	1.8-3.0V	0-0.2V	0-0.2V	0-0.2V	2.4-3.0V
GSM850 Rx	0-0.2V	0-0.2V	0-0.2V	0-0.2V	2.4-3.0V
GSM900 Rx	0-0.2V	0-0.2V	1.8-3.0V	0-0.2V	2.4-3.0V
GSM1800 Rx	0-0.2V	1.8-3.0V	1.8-3.0V	0-0.2V	2.4-3.0V
GSM1900 Rx	0-0.2V	1.8-3.0V	0-0.2V	0-0.2V	2.4-3.0V
UMTS1	1.8-3.0V	0-0.2V	1.8-3.0V	0-0.2V	2.4-3.0V
UMTS2	1.8-3.0V	0-0.2V	1.8-3.0V	1.8-3.0V	2.4-3.0V
Idle	0-0.2V	0-0.2V	0-0.2V	0-0.2V	0-0.2V

Logic Table of the Antenna Switch

Checking Switch Block power source
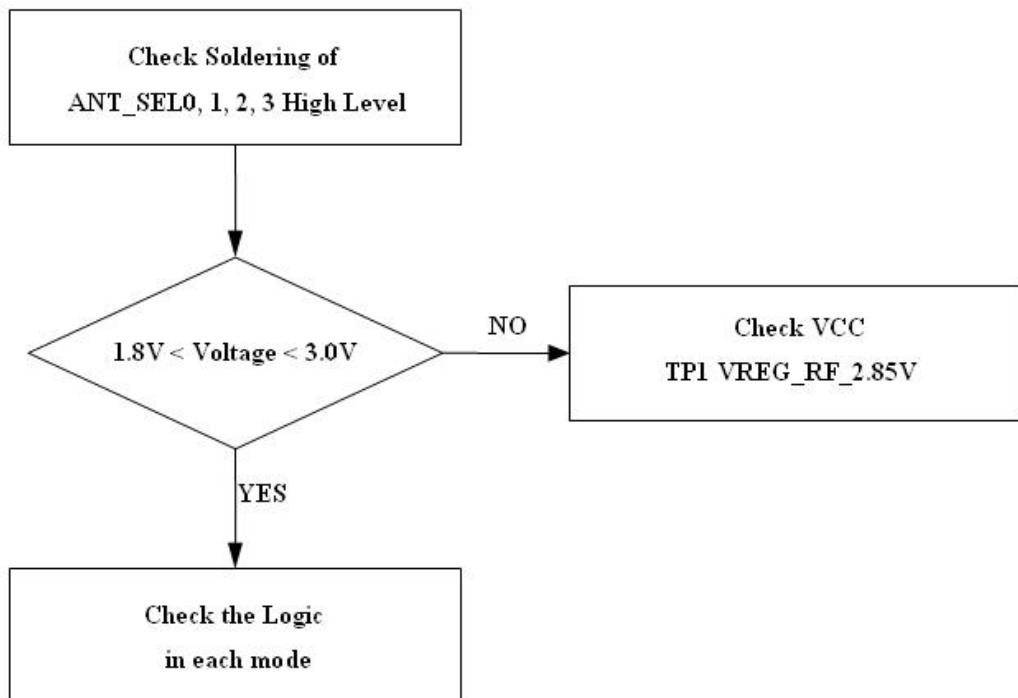
4.4 Checking UMTS Block

4.4.1 Checking TX POWER of UMTS 1900MHz
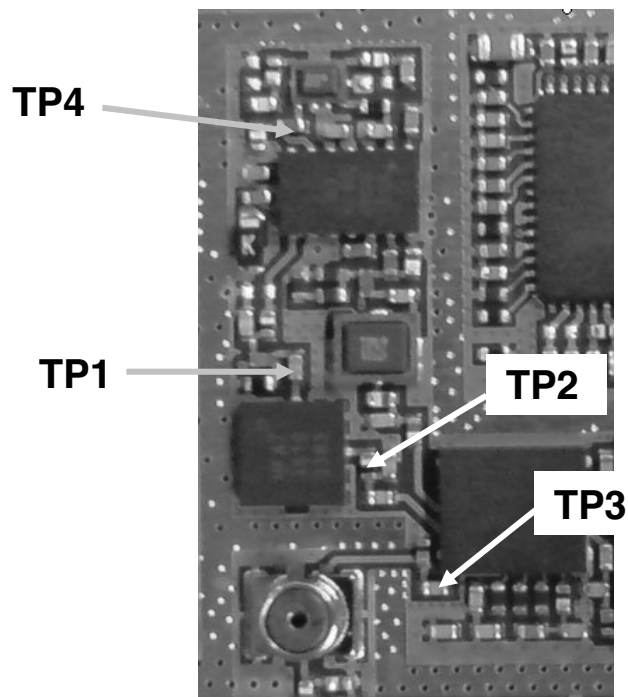
Test Point (RF TX POWER of UMTS1900)

For testing, Max power of UMTS1900MHz is needed.

Run a FTM program
set RF mode to
1900B set uplink
freq. to 9262 Click Tx
On and WCDMA set
PA range R0 and R1
on set Tx AGC to 410

Check a
current over
500mA?

YES

Check TP1
over 25dBm?

NO

Check a
Coupler U104
and a soldering
of L124

NO

YES

Check Tx SAW
Filter and a soldering
of C65, L125

NO

Check TP4
over -5dBm?

Check TP2
over 23dBm?

NO

Check a
Duplexer and
a soldering of
C66

YES

YES

Check PAM block
Refer to 3.5.3

Check TP3
over 22dBm?

NO

Check
ANT.SW
Module FL100

YES

Tx is OK
Check other
parts

4.4.2 Checking TX POWER of UMTS 850MHz
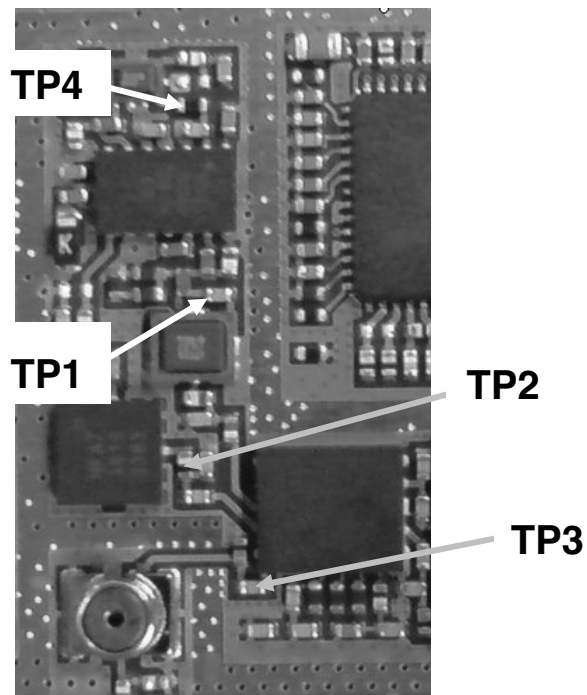
Test Point of RF TX POWER of UMTS 850

For testing, Max power of UMT850MHz is needed.

```
┌─────────────────────┐
│ Run a FTM program   │
│ set RF mode to       │
│ 800 set uplink       │
│ freq. to 4135 Click Tx│
│ On and WCDMA set     │
│ PA range R0 and R1   │
│ on set Tx AGC to 410 │
└─────────────────────┘
```

Check a current over 450mA? —YES→ Check TP1 over 25dBm? —NO→ Check a Coupler U102 and a soldering of L127, C149

Check a current over 450mA? —NO↓

Check TP1 over 25dBm? —YES↓

Check Tx SAW Filter and a soldering of L122, L123 ←NO— Check TP4 over -5dBm?

Check TP2 over 23dBm? —NO→ Check a Duplexer and a soldering of C51

Check TP4 over -5dBm? —YES↓

Check PAM block Refer to 3.5.3

Check TP2 over 23dBm? —YES↓

Check TP3 over 22dBm? —NO→ Check ANT.SW Module FL100

Check TP3 over 22dBm? —YES↓

Tx is OK Check other parts

4.4.3 Checking UMTS PAM Control Block

・PAM control signal

1. PWR_DET : UMTS Tx Power Detected value (Check R125)

2. TX_AGC_ADJ : UMTS RTR6275 Tx Amp Gain Control

3. VREG_RF_SMPS : UMTS PAM enable (about 2.85V)

4. VREG_W_PA : UMTS PAM Main Voltage (3V < +VPWR < 4.2V)
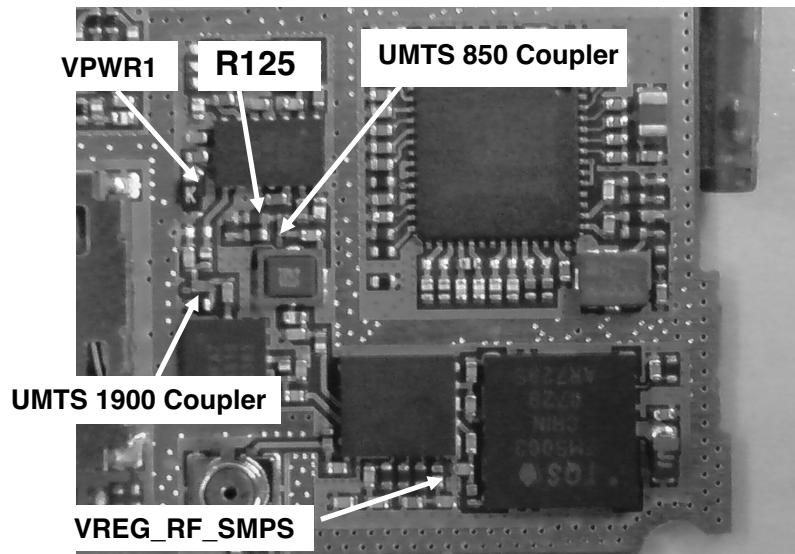
4.4.4 Checking RF Rx Level

WCDMA

4. TROUBLE SHOOTING

Set the Phone Rx is ON

Check Vbias/Vbias' Over 2V? — NO → Check bias Block soldering

YES

Check TP1 Signal exist? — NO → Check ANT100

YES

Check TP2/TP2' Signal exist? — NO → Check Ant, Switch Module FL100

YES

Check TP3/TP3' Signal exist? — NO → Check Duplexer FL102,FL104

YES

Check TP4/TP4' Signal exist? — NO → Check RFR6275 and FL105, FL106

YES

Rx is OK Check other Parts
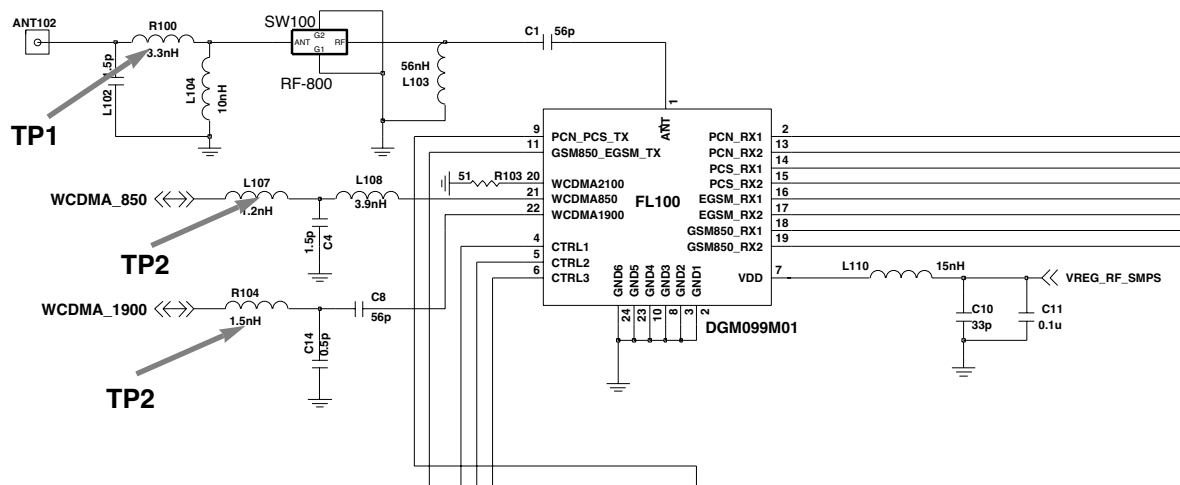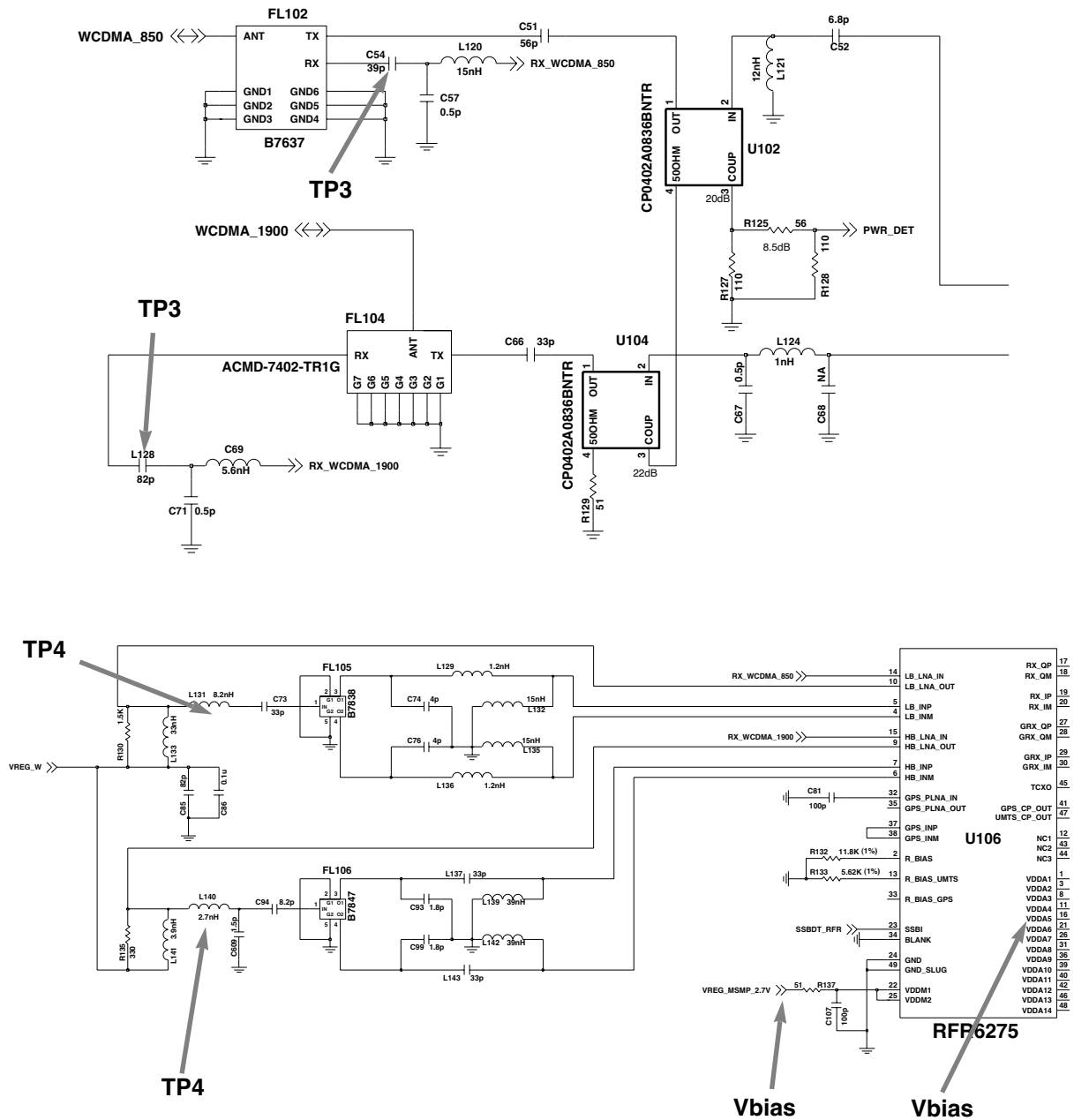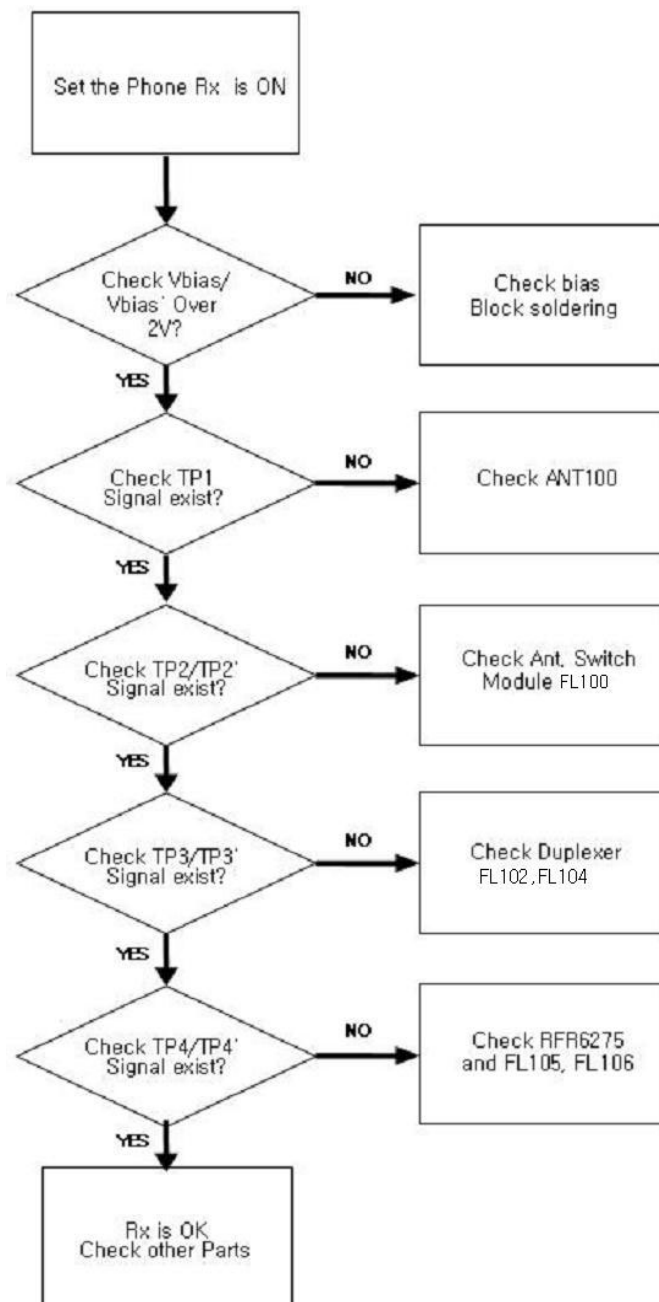
※ **TP* : UMTS 850 RX PATH**

TP* : UMTS 1900 RX PATH

4.5 Checking GSM Block

START

↓

1. Check ANT. SW Module

↓

2. Check Tx PAM Block

↓

3. Check RF Rx Level

↓

4. Re-download SW & CAL.
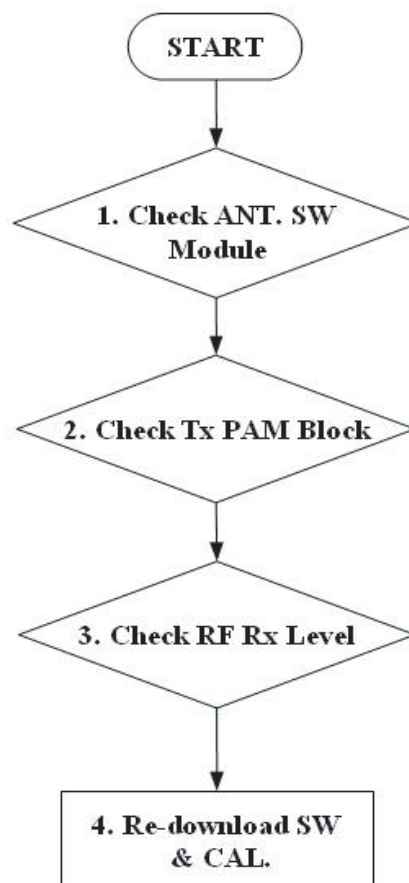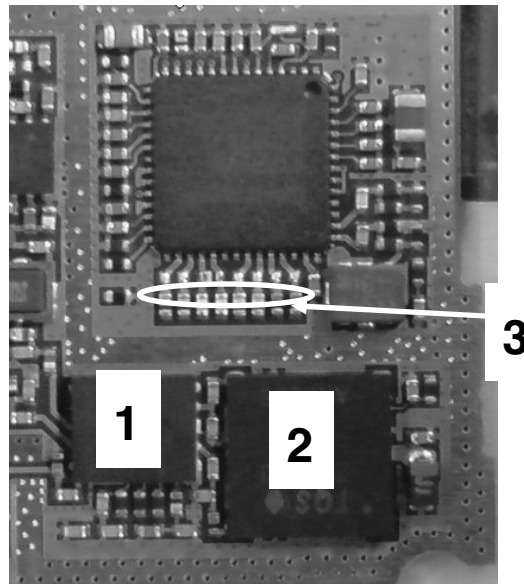
4.5.1 Checking Ant. SW Module

Refer to chapter 3.3
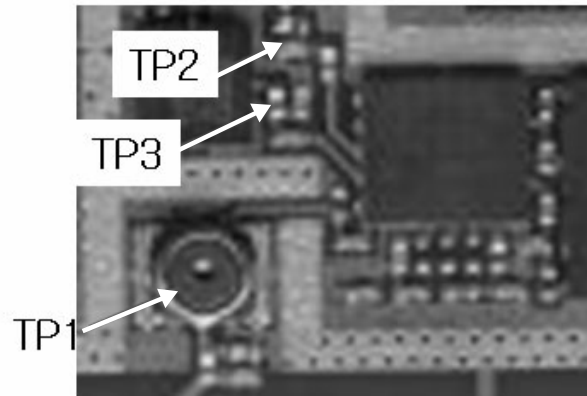
Schematic of RF Tx level
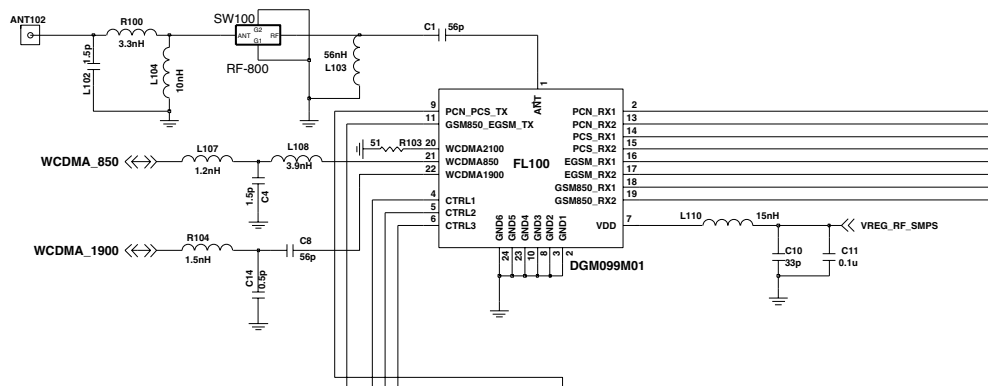
ANTENNA SWITCH MODULE LOGIC

	ANT_SEL0	ANT_SEL1	ANT_SEL2
GSM900/GSM850 TX	HIGH	LOW	HIGH
DCS/PCS TX	LOW	HIGH	HIGH
GSM 850 RX	LOW	LOW	LOW
GSM 900 RX	HIGH	LOW	LOW
DCS RX	HIGH	HIGH	LOW
PCS RX	LOW	HIGH	LOW
UMTS 850	LOW	HIGH	HIGH
UMTS 1900	LOW	LOW	HIGH

Checking RF Tx level

```
                    ┌─────────────┐
                    │    START    │
                    └──────┬──────┘
                           │
                           ▼
        Check TP1                              ┌──────────────┐
  If GSM850/GSM900 over 39dBm?    ── YES ──▶   │    Check     │
     If PCS/DCS over 28dBm?                    │   RTR6275    │
                           │                   └──────┬───────┘
                          NO                          │
                           ▼                          ▼
       Check TP2, TP3                         ┌──────────────┐
      If TP2 over 30dBm?         ── YES ──▶   │ Check Soldering│
      If TP3 over 29dBm?                      │  & MSM6260   │
                           │                  └──────┬───────┘
                          NO                         │
                           ▼                         ▼
     Check PAM Block OK?                      ┌──────────────┐
     Refer to chapter 3.5.2      ── YES ──▶   │    Check     │
                           │                  │  PMIC(U401)  │
                          NO                  └──────────────┘
                           ▼
   ┌────────────────────────┐
   │ Check Soldering of PAM │
   │         Block          │
   │  If problems still exit,│
   │   replace the PAM      │
   └───────────┬────────────┘
              NO
               ▼                              ┌──────────────┐
     Problems resolved?          ── YES ──▶   │GSM850/GSM900/│
                           │                  │   DCS/PCS    │
                          NO                  │   TX is OK   │
                           ▼                  └──────────────┘
   ┌────────────────────────┐
   │     Change the Board   │
   └────────────────────────┘
```
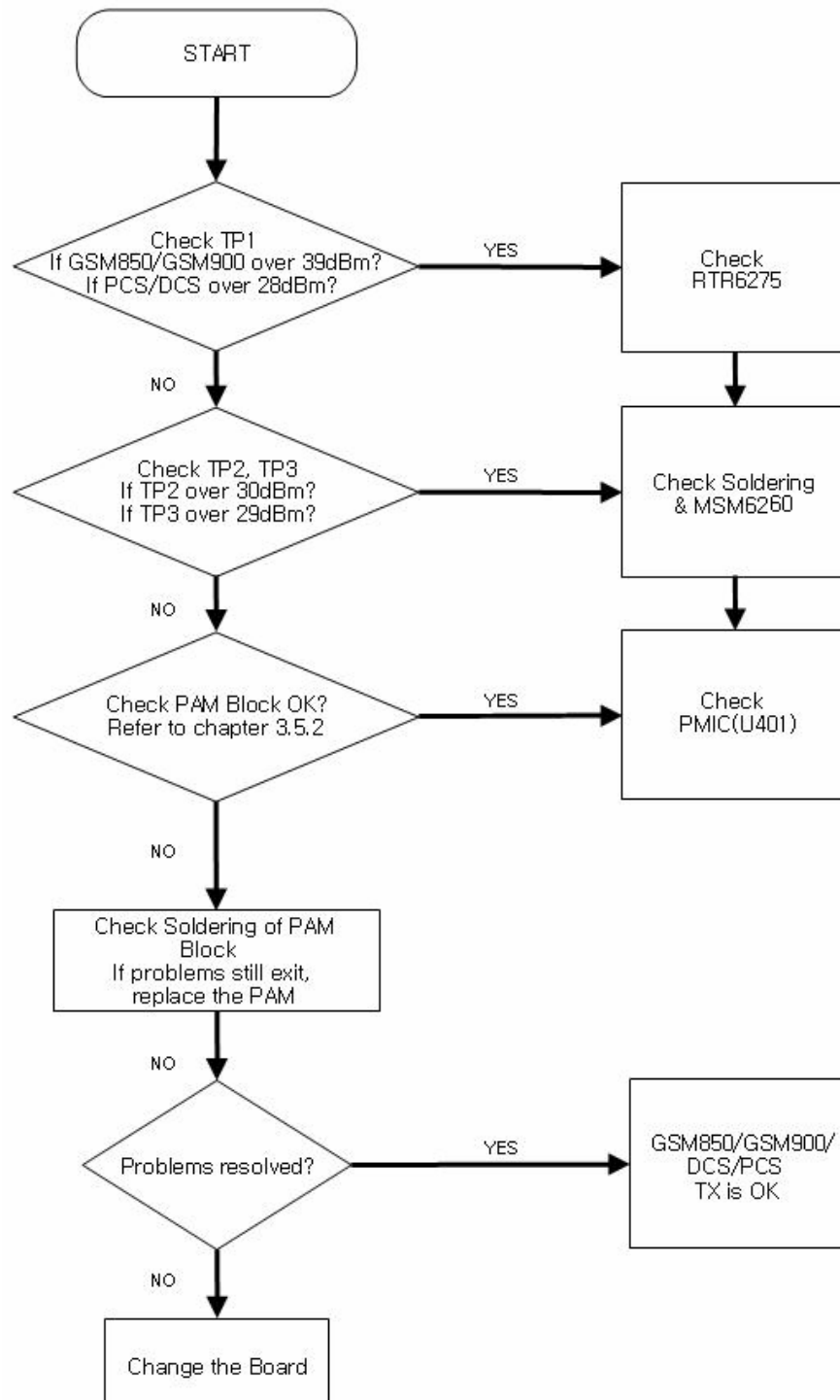
4.5.2 Checking PAM Block

TP1. GSM_PA_RAMP : Power Amp Gain Control. typically, $0.2V < Vramp < 1.6V$

TP2. GSM_PA_BAND : Power Amp Band Selection Control

    (GSM Mode : $-0.2V < VBS < 0.4V$, DCS/PCS Mode : $1.25V < VBS < 3.0V$)

TP3. GSM_PA_EN : Power Amp Enable

    (Power ON : higher than 1.25V , Power OFF : lower than 0.4V)

TP4. +VPWR : PAM Supply Voltage Vcc higher than 3.0V
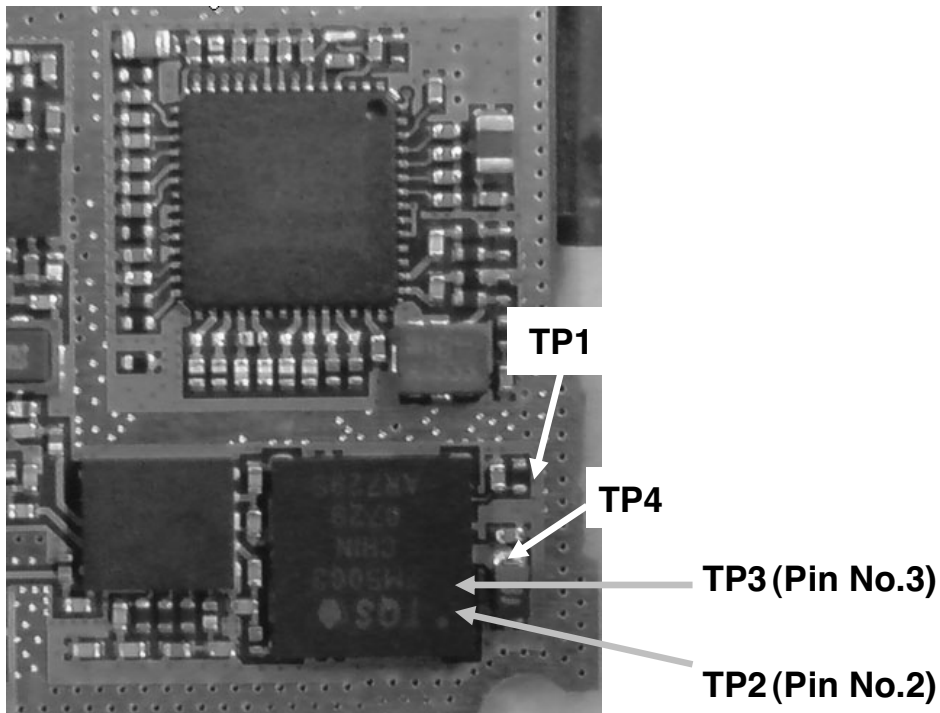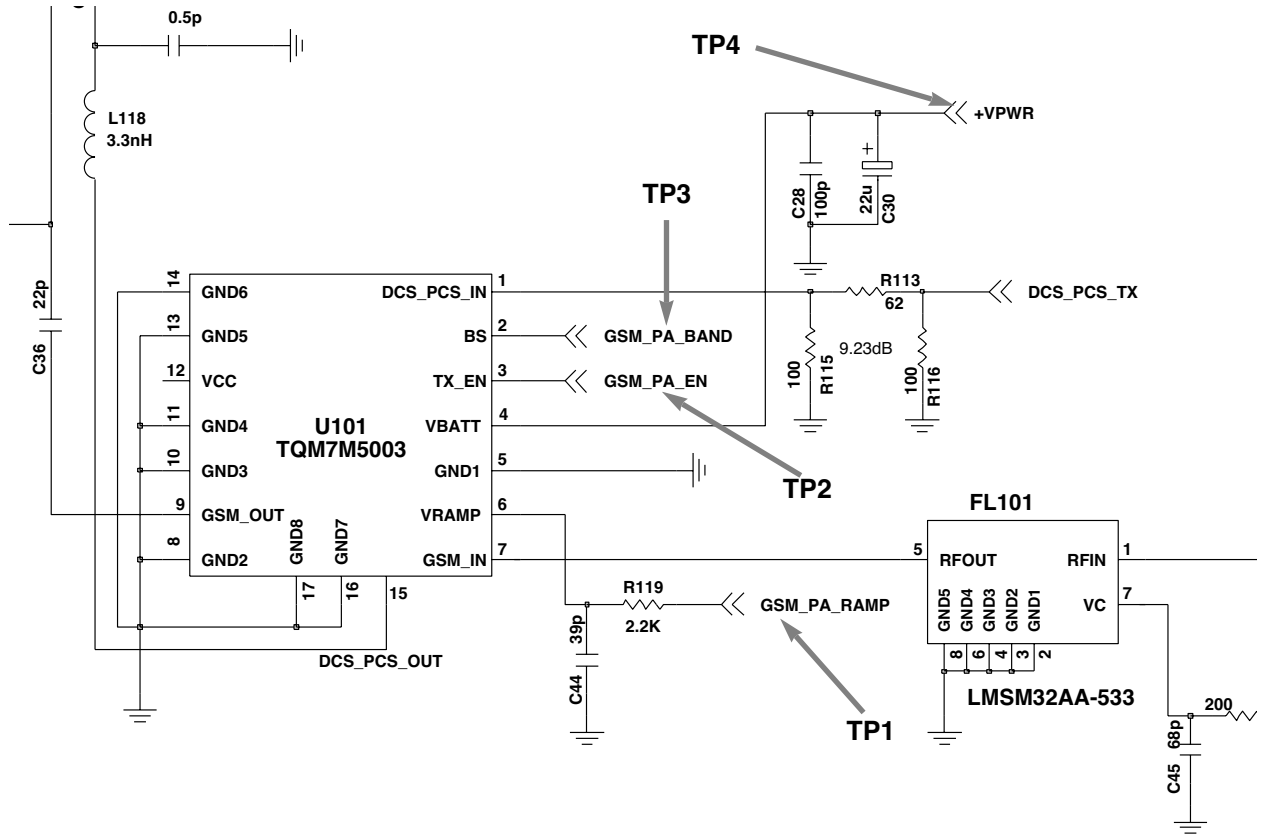
Schematic of GSM PAM Block

4.5.3 Checking RF Rx Block

TP1. GSM850 Rx Input

TP2. GSM900 Rx Input

TP3. PCS Rx Input

TP4. DCS Rx Input

GSM850/GSM900/DCS/PCS Rx Block

START

TP1,TP2,TP3,TP4
Signals exits?

NO → Check ANT.SW
Module FL100 and
soldering of TPs

YES

Rx still has problems?

NO → GSM850/GSM900/
DCS/PCS Rx is OK

YES

Re-download &
Calibration
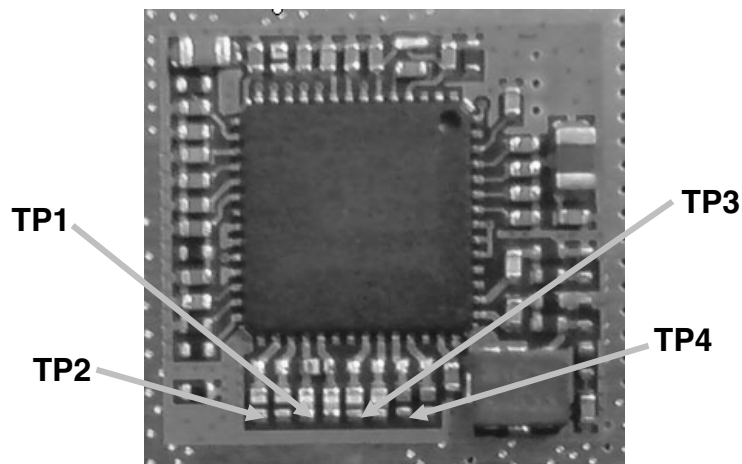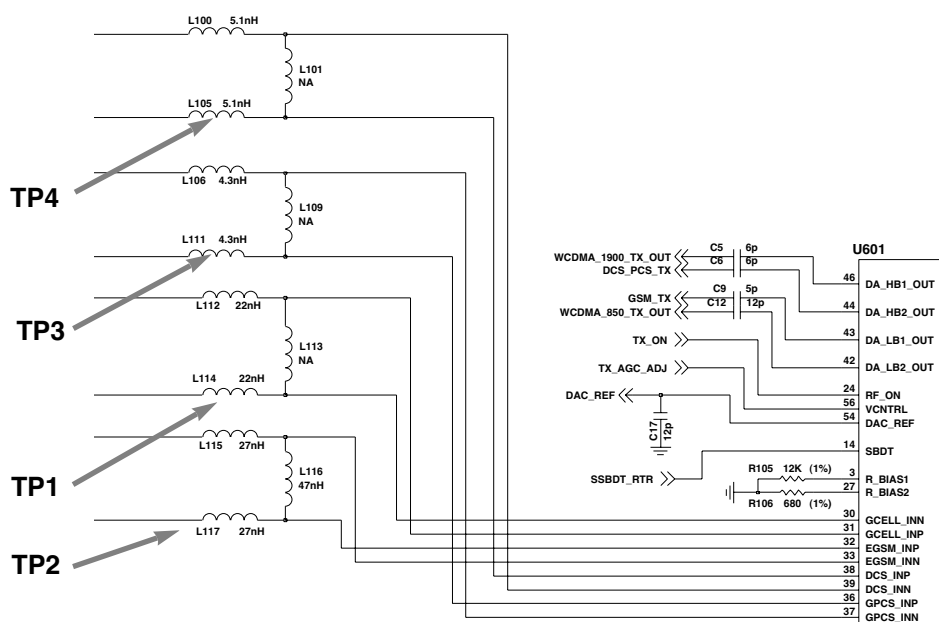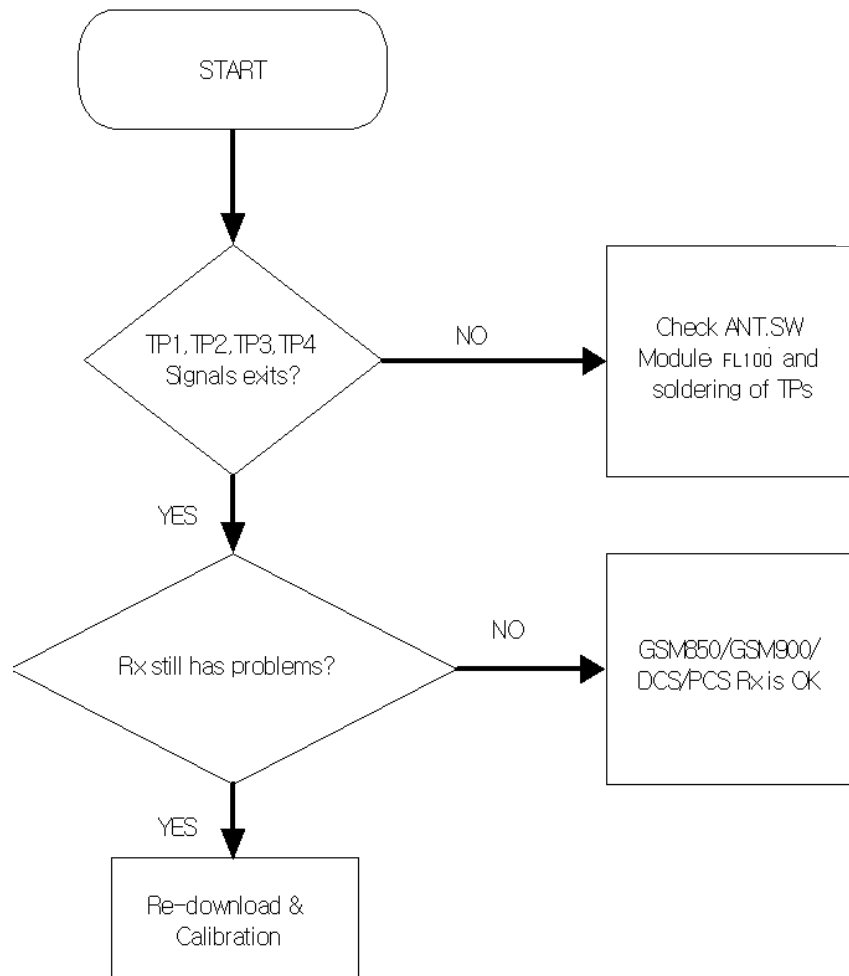
4.5.4 BLUETOOTH Checking Block

BLUETOOTH

Start

1,TP TP2
Signals exits?

NO → Change the Main board

YES

TP3
Is clock ok? 19.2M

NO → Change the X100

YES

TP4
Signals exits?

NO → Change the M100

YES

Change the Main board
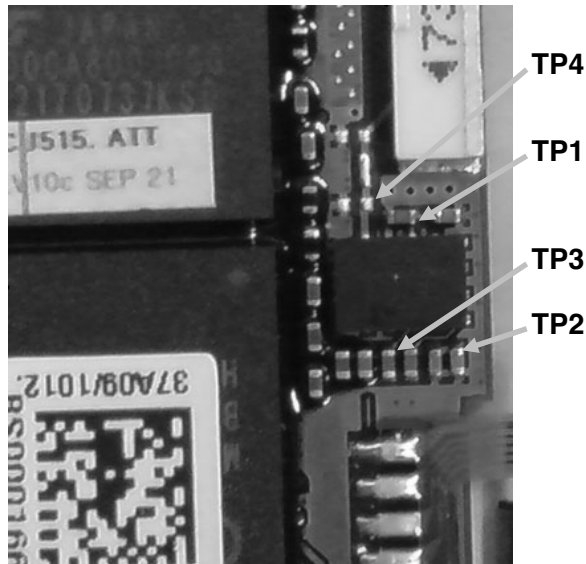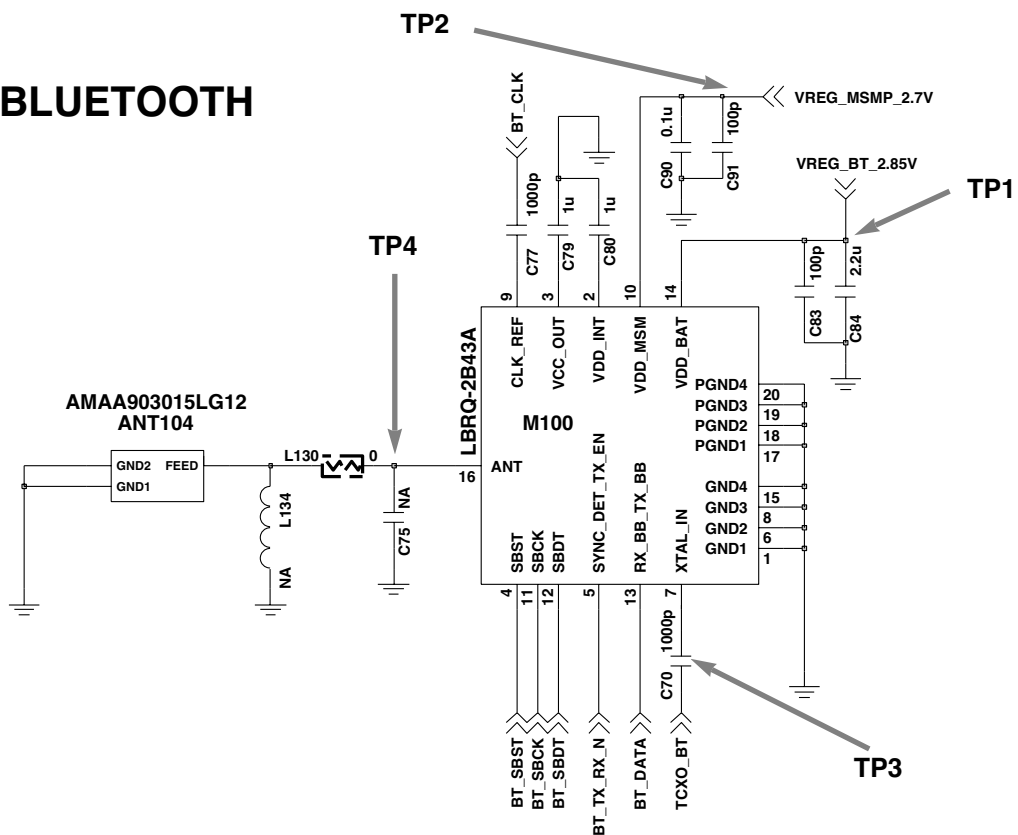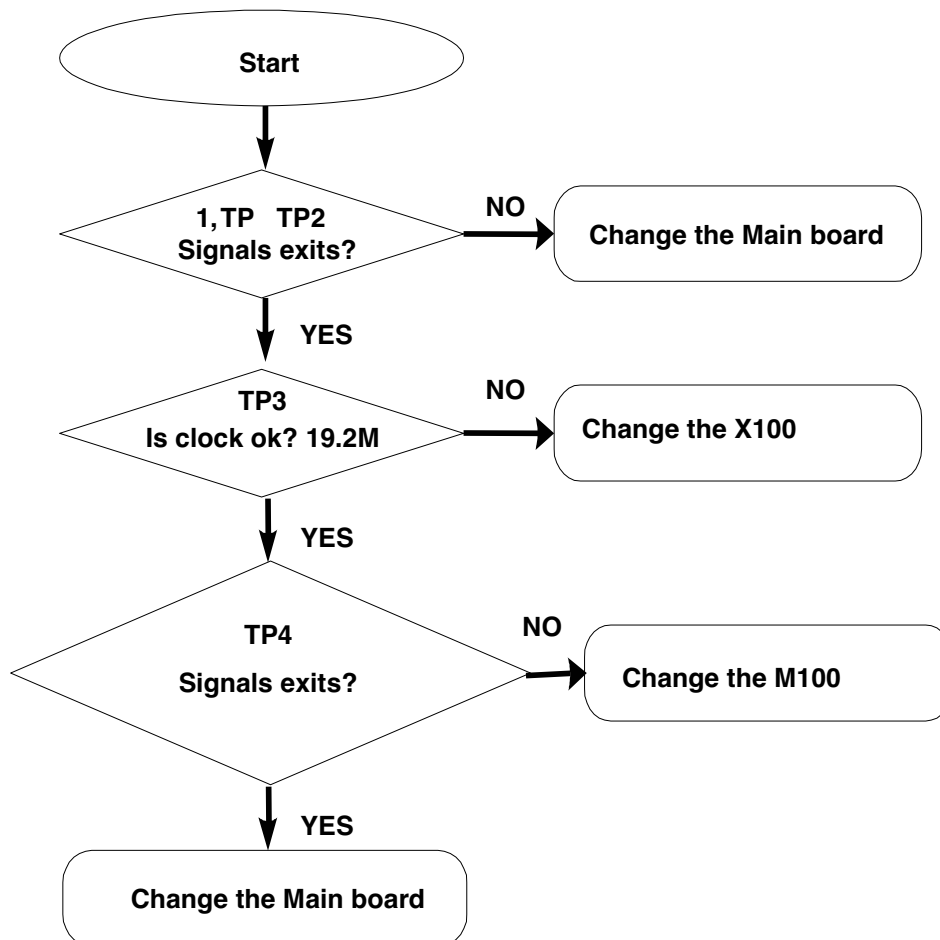
4.6 Power ON Troubleshooting

Power On sequence of CU515 is :

PWR key press(Key PCB) → PM_ON_SW_N go to low(D600),PM6650 KPDPWR_N pin(24) →
PM6650 Power Up → VREG_MSMC_1.25V(C434), VREG_MSME_1.8V(C435),
VREG_MSMP_2.7V(C426), VREG_MSMA_2.6V(C424), VREG_TCXO_2.85V(C414) power up
and system reset assert to MSM → Phone booting and PS_HOLD(D400) assert to PMIC

```
                    ┌────────────┐
                    │   Start    │
                    └────────────┘
                          │
              ┌───────────────────┐      NO    ┌──────────────────────┐
              │ Battery voltg.     │──────────→│ Change or charging    │
              │ higher than 3.28V? │           │ the Battery           │
              └───────────────────┘           └──────────────────────┘
                     │ YES
              ┌───────────────────┐      NO    ┌──────────────────────┐
              │ D600 high to low   │──────────→│ Check the Key Dome    │
              │ when key press?    │           └──────────────────────┘
              └───────────────────┘
                     │ YES
              ┌───────────────────────────┐  NO  ┌──────────────────────┐
              │ VREG_MSMC_1.25V,          │─────→│ Change the Main board │
              │ VREG_MSMP_2.7V,           │      └──────────────────────┘
              │ VREG_MSME_1.8V,           │
              │ VREG_TCXO_2.85V,          │
              │ VREG_MSMA_2.6V power up?   │
              └───────────────────────────┘
                     │ YES
              ┌───────────────────────────┐  NO  ┌──────────────────────┐
              │ Is clock ok?              │─────→│ Check the TXCO        │
              │ R408 : 19.2M              │      └──────────────────────┘
              │ X400(pin1,4) : 32.768Khz  │
              └───────────────────────────┘
                     │ YES
              ┌──────────────────────┐
              │ Change the Main board │
              └──────────────────────┘
```

VREG_MSMP

VREG_MSMA   D400
             PS_HOLD

VREG_MSMC

VREG_MSME

VREG_TCXO

X400 :
32.768Khz

R408 : 19.2Mhz
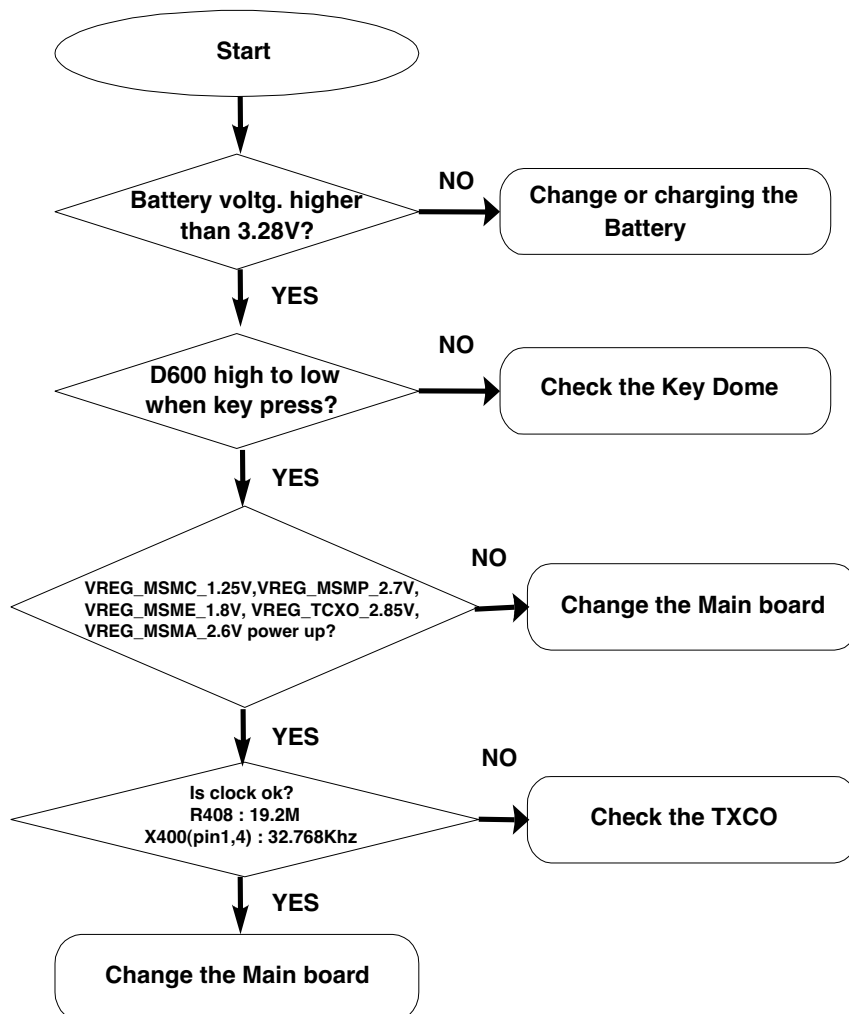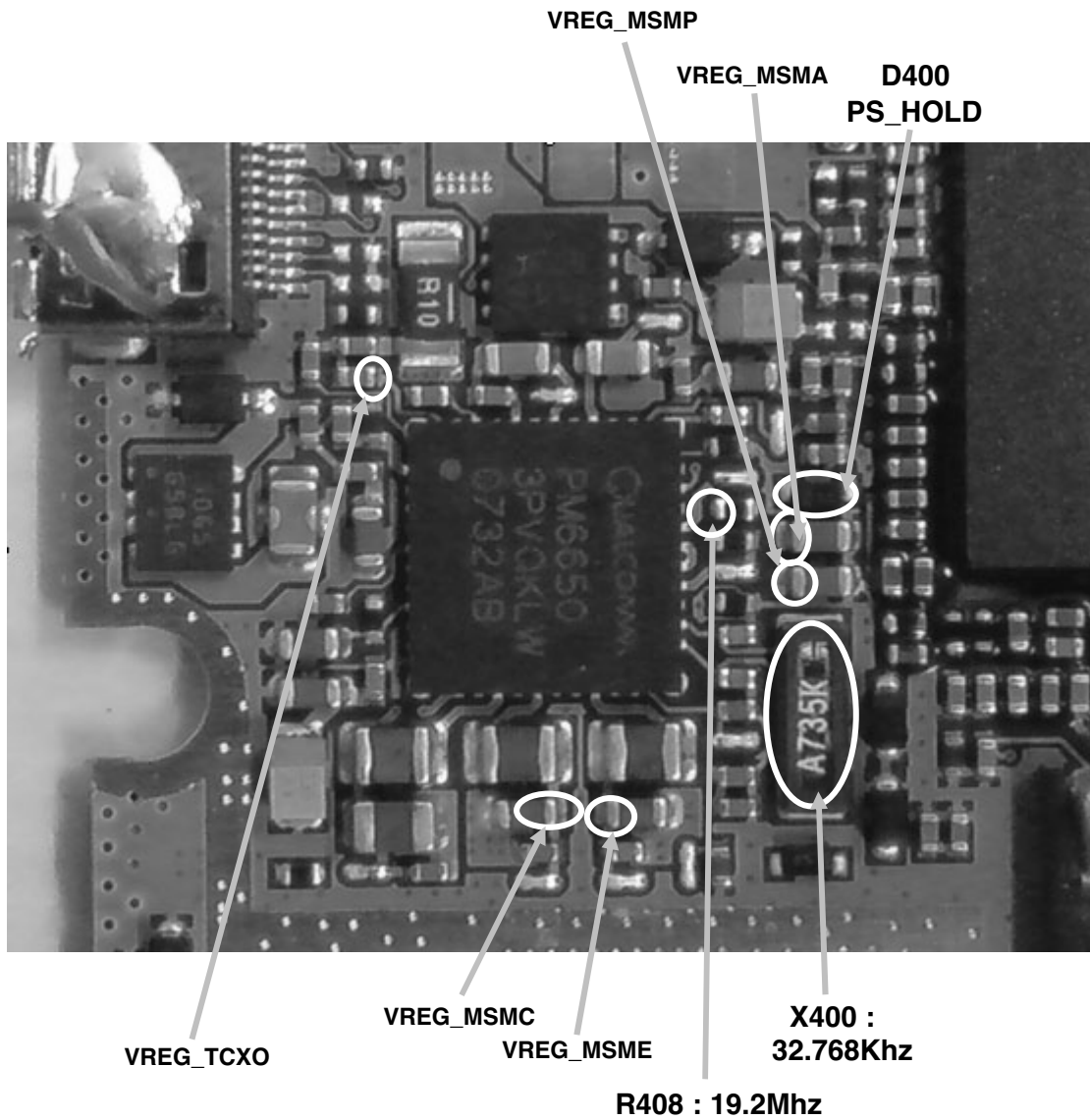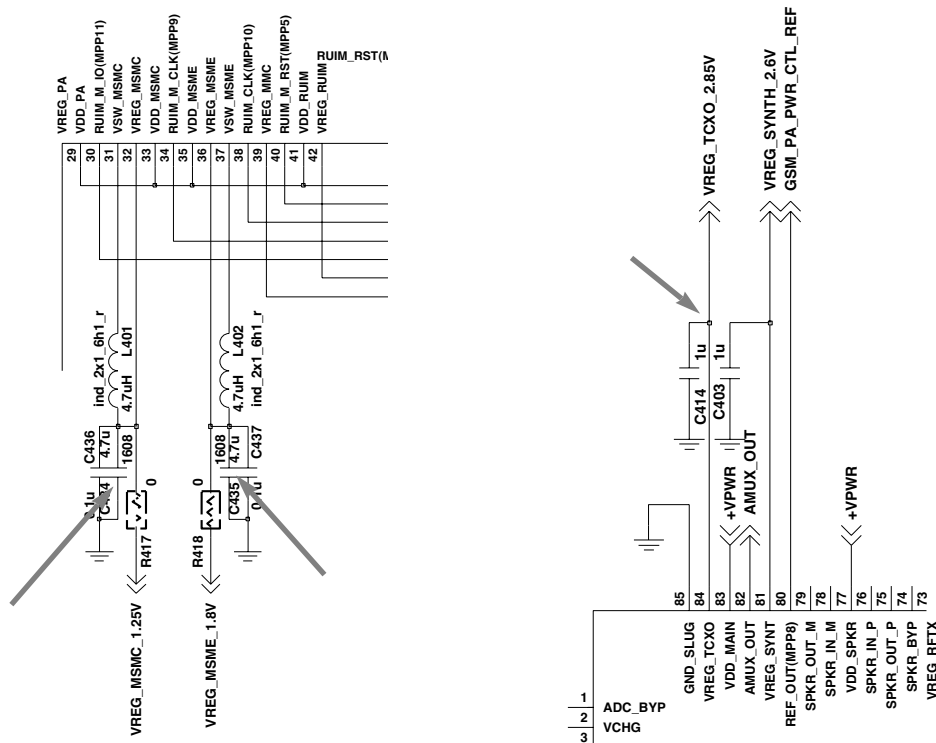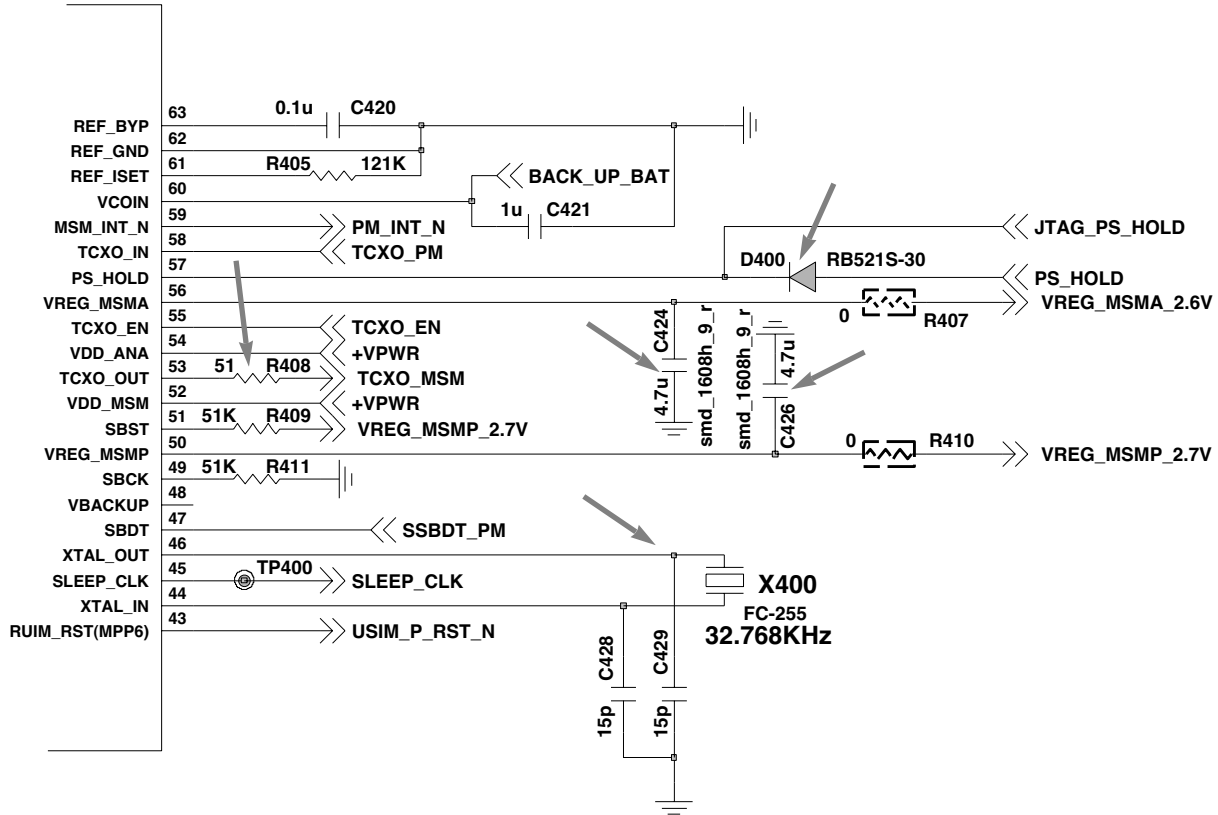
4.7 Charger Troubleshooting

Charging Current Flow

Differential lines, route as equal length as possible !! --> ICHARGE , ICHARGEOUT

Battery Charging Circuit

U402

TA (5.1V)		

VBATT 10 P_DRAIN P_COLLECTOR 9

+5V_PWR 1 EMITTER1 BASE1 8 CHG_CNT_N   Pass Tr (ON)

USB_VBUS 2 EMITTER2 BASE2 7 USB_CNT_N

ICHARGE 3 COLLECTOR GATE 6 BATT_FET_N Battery FET (ON)

4 SOURCE DRAIN 5 VBATT

R413 0.1

NUS3116MTR2G

ICHARGEOUT

+VPWR

4.2~4.25V **Main Battery**

Charging Procedure

- Connect TA

- Control the charging current by PM6650 IC

- Charging current flows into the battery

Check Point

- Connection of TA

- Charging current path

- Battery

Troubleshooting Setup

- Connect TA and battery to the phone

Troubleshooting Procedure

- Check the charger connector

- Check the charging current Path

- Check the battery
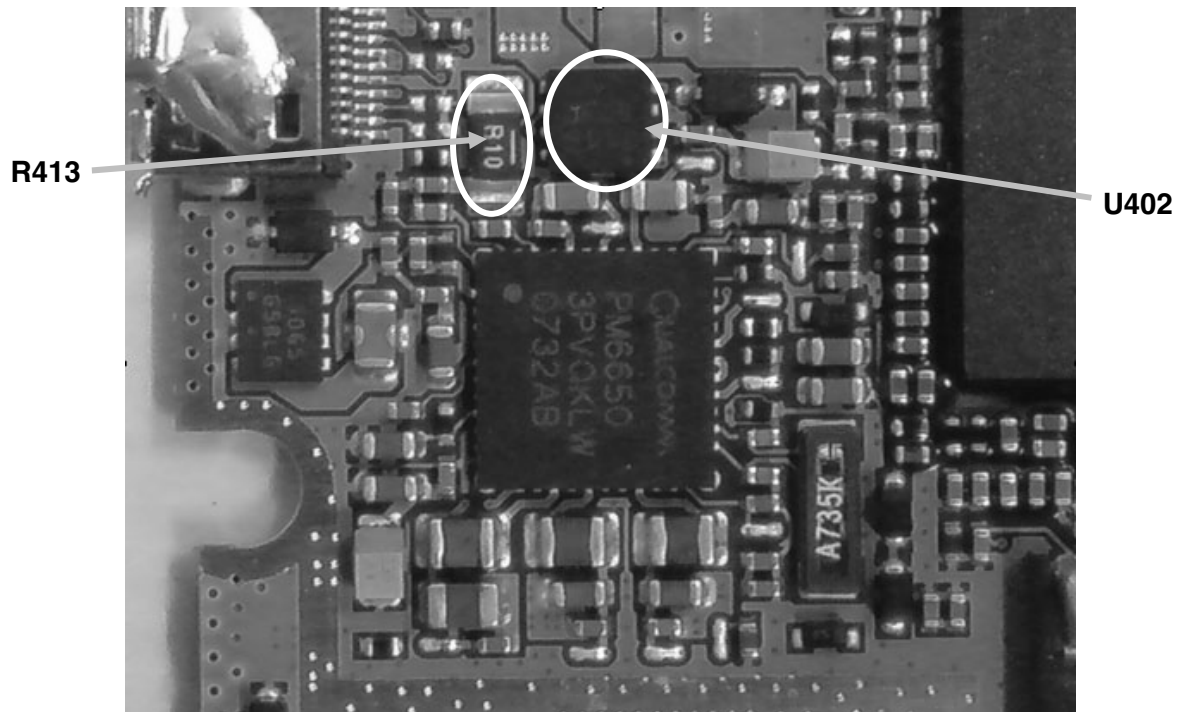
R413

U402

```
┌─────────────────────────────────────────────────────────────────┐
│     Differential lines, route as equal length as possible !!  --> ICHARGE , ICHARGEOUT     │
└─────────────────────────────────────────────────────────────────┘
```

Battery Charging Circuit

		U402		
VBATT	10	P_DRAIN P_COLLECTOR	9	
+5V_PWR	1	EMITTER1 BASE1	8	CHG_CNT_N
USB_VBUS	2	EMITTER2 BASE2	7	USB_CNT_N
ICHARGE	3	COLLECTOR GATE	6	BATT_FET_N
	4	SOURCE DRAIN	5	VBATT

R413 0.1

NUS3116MTR2G

ICHARGEOUT

+VPWR
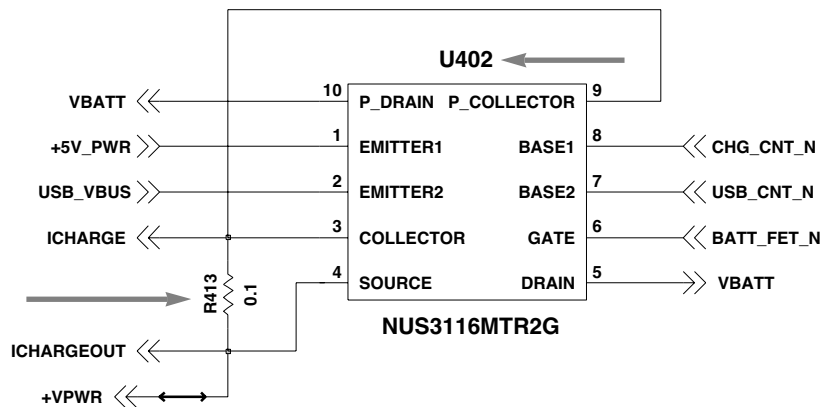
Figure . Chraging part schemetics

Figure . Chraging part schemetics

```
                        ┌──────────────┐
                        │    Start     │
                        └──────┬───────┘
                               │
                               ▼
               ┌───────────────────────────────┐
               │ Check the pin and battery      │
               │ Connect terminals of I/O       │
               │ connector                      │
               └───────────────┬───────────────┘
                               │
                               ▼            NO
                        ◇ Connection OK? ────────► ┌──────────────────────┐
                               │                   │ Change I/O connector │
                             Yes                   └──────────────────────┘
                               │
                               ▼            NO
                        ◇ Is the TA voltage ──────► ┌──────────────┐
                          5.1V?                     │  Change TA   │
                               │                    └──────────────┘
                             Yes
                               │
                               ▼            Yes
                        ◇ Is it charging ─────────► ┌──────────────┐
                          properly                  │     END      │
                          After turning on          └──────────────┘
                          U402 ?
                               │
                              NO
                               │
                               ▼
               ┌───────────────────────────────┐
               │ Change the board              │
               └───────────────────────────────┘
```
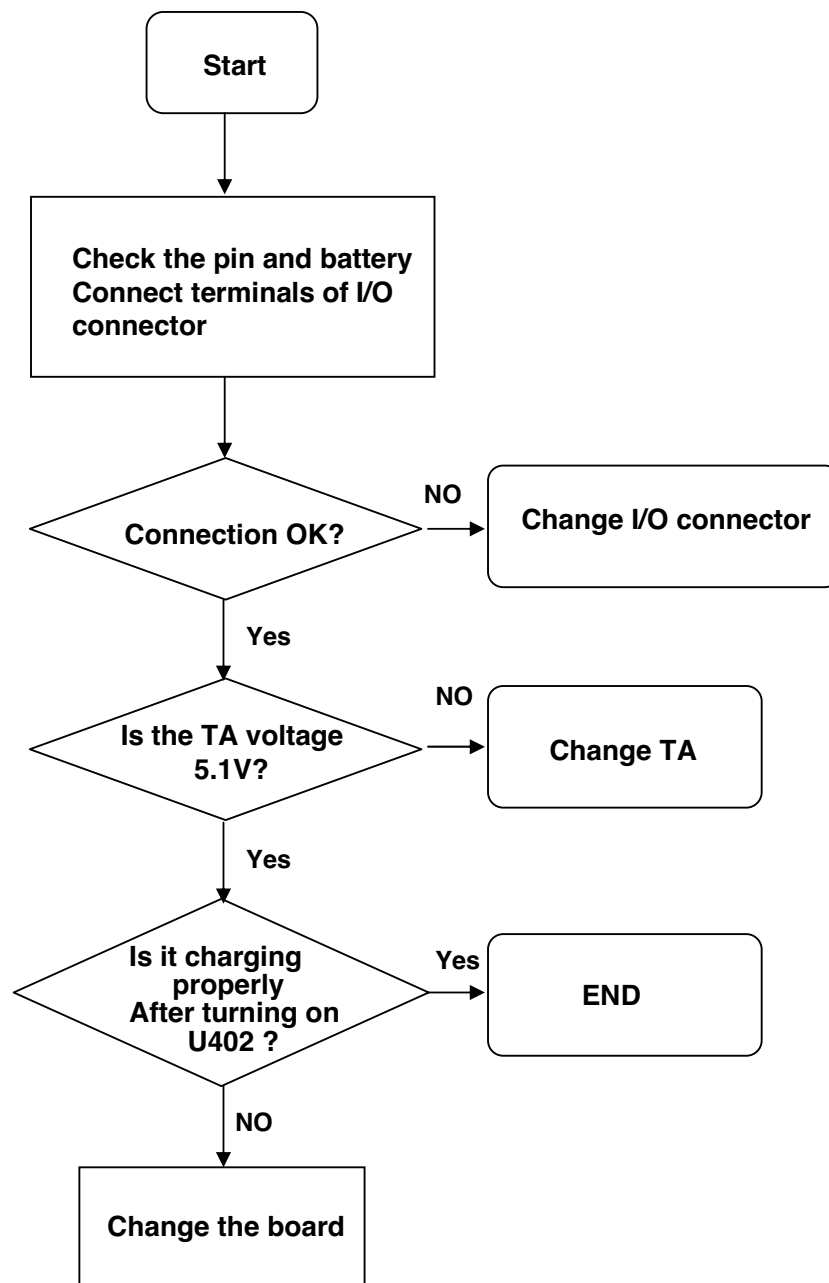
4.8 USB Troubleshooting

USB Initial sequence of CU515 is :

USB connected to CU515 power on → USB_VBUS(U402) go to 5V → USB_D+ go to 3.3V →
USB_VP and USB_VN is triggered → USB work.

```
        ( Start )
            |
            v
      < Power is on? > --NO--> ( Go to power on trouble shooting )
            |
           YES
            v
    < Cable is inserted? > --NO--> ( Insert cable )
            |
           YES
            v
     < U402 2pin is 5V? > --NO--> ( Check U402 2Pin )
            |
           YES
            v
     < USB_D+ is 3.3V? > --NO--> ( Check U401 )
            |
           YES
            v
  ( Change the Main board )
```

D500

U402

Differential lines, route as equal length as possible !! --> ICHARGE , ICHARGEOUT

Battery Charging Circuit

	U402	
10	P_DRAIN P_COLLECTOR	9
VBATT		
+5V_PWR	1 EMITTER1 BASE1 8	CHG_CNT_N
USB_VBUS	2 EMITTER2 BASE2 7	USB_CNT_N
ICHARGE	3 COLLECTOR GATE 6	BATT_FET_N
	4 SOURCE DRAIN 5	VBATT

R413 0.1

ICHARGEOUT

+VPWR

NUS3116MTR2G

D500

USB_D-	6		1	USB_D+
	5		2	
USB_VBUS	4		3	

PLR0504F

4.9 SIM Detect Troubleshooting

USIM Initial sequence of L704i is :

USIM_CLK,USIM_RST,USIM_DATA triggered → VREG_USIM_2.85V go to 2.85V → USIM IF work

```
                          ┌──────────────┐
                          │    Start     │
                          └──────┬───────┘
                                 │
                                 ▼
                     ┌───────────────────────┐
                     │ Re-insert the SIM card │
                     └───────────┬───────────┘
                                 │
                                 ▼
                          ╱ Work well? ╲ ──Yes──▶  ┌───────┐
                          ╲           ╱             │  End  │
                                 │                  └───────┘
                                 │ No
                                 ▼
              ╱ VREG_USIM_2.85V is 2.8 V? ╲  5  NO  ┌──────────────┐
              ╲ USIM_P_CLK is run?        ╱ ──────▶ │  Check CN503 │
                                 │                  └──────────────┘
                                 │ YES
                                 ▼
                     ┌───────────────────────┐
                     │    Change SIM card     │
                     └───────────┬───────────┘
                                 │
                                 ▼
                          ╱ Work well? ╲ ──Yes──▶  ┌───────┐
                          ╲           ╱             │  End  │
                                 │                  └───────┘
                                 │ No
                                 ▼
                     ┌────────────────────────┐
                     │  Change the Main board  │
                     └────────────────────────┘
```

USIM
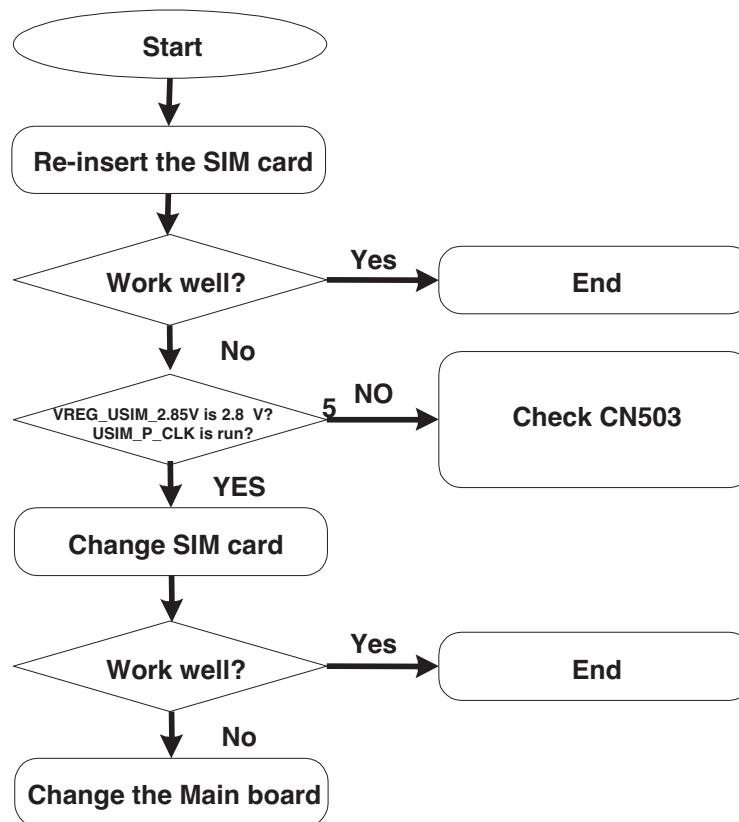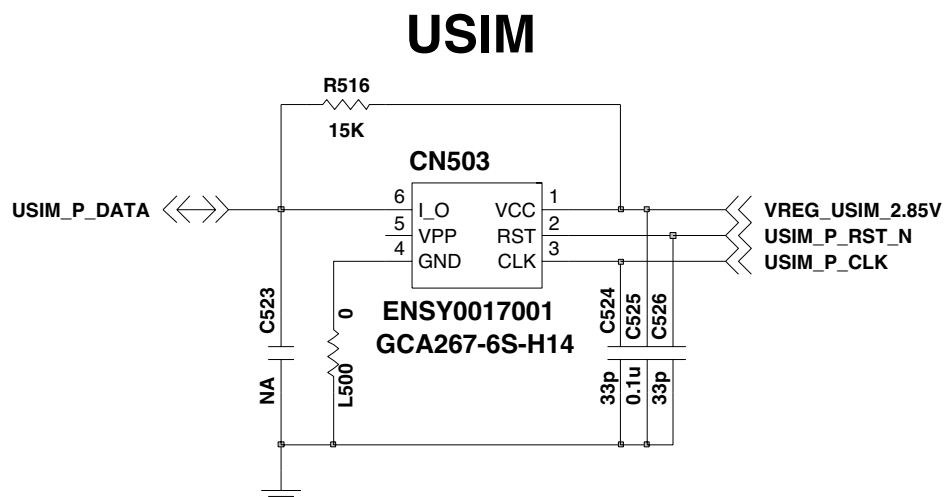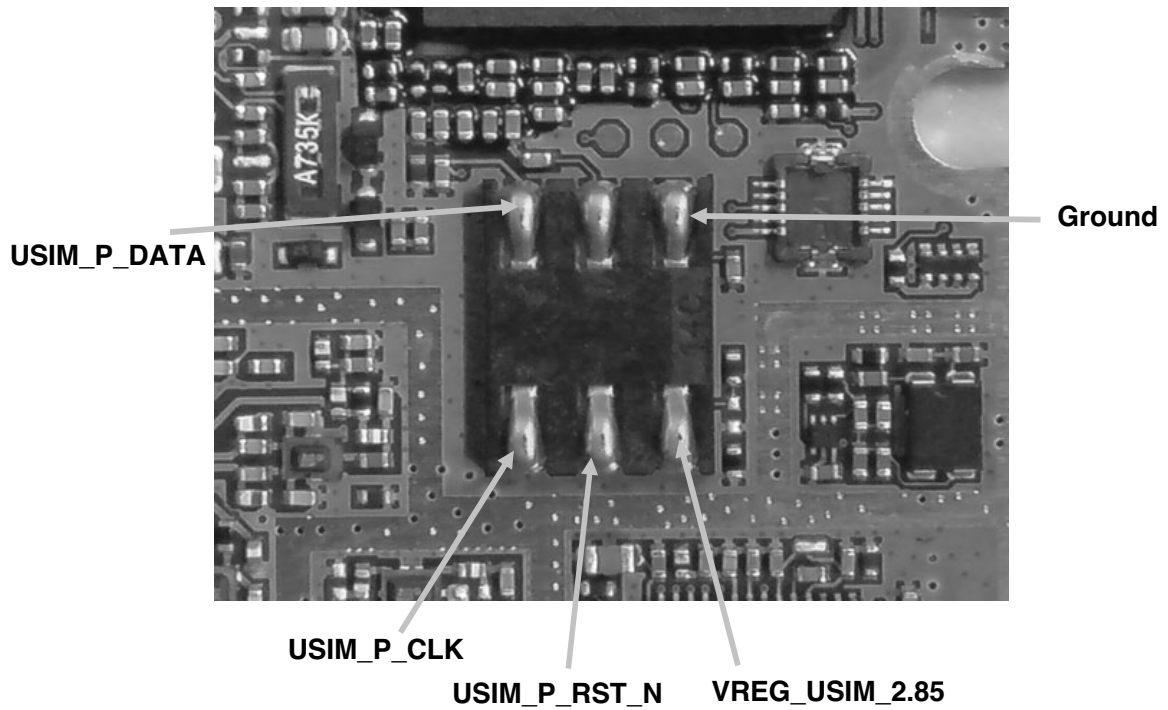
4.10 Camera Troubleshooting

Camera control signals are generated by MSM6260.

```
                        ┌──────────────┐
                        │    Start     │
                        └──────┬───────┘
                               │
                   ┌───────────▼──────────────┐
                   │ Check the camera connector and │
                   │   reconnect the camera    │
                   └───────────┬──────────────┘
                               │
                           ╱───▼───╲              Yes
                          ╱ Camera  ╲ ───────────────────▶   END
                          ╲ is OK?  ╱
                           ╲───┬───╱
                               │ NO
                           ╱───▼──────────────────╲         NO
                          ╱ VREG_CAM_AVDDV is 2.8V?(C510) ╲ ──────▶ Change the Main board
                          ╲ VREG_CAM_1.5V is 1.5V?(C508)  ╱
                          ╲ VREG_MSMP_2.7V is 2.7V?(C511) ╱
                           ╲──────┬───────────────╱
                               │ Yes
                           ╱───▼───────╲                    NO
                          ╱ Check the CAM_MCLK ╲ ──────────▶ Change the Main board
                          ╲    (FB501)         ╱
                           ╲───┬───────╱
                               │ Yes
                   ┌───────────▼──────────────┐
                   │   Change the camera      │
                   └───────────┬──────────────┘
                               │
                           ╱───▼───╲              Yes
                          ╱ Camera  ╲ ───────────────────▶   END
                          ╲ is OK   ╱
                           ╲───┬───╱
                               │ NO
                   ┌───────────▼──────────────┐
                   │   Change the Main board  │
                   └──────────────────────────┘
```
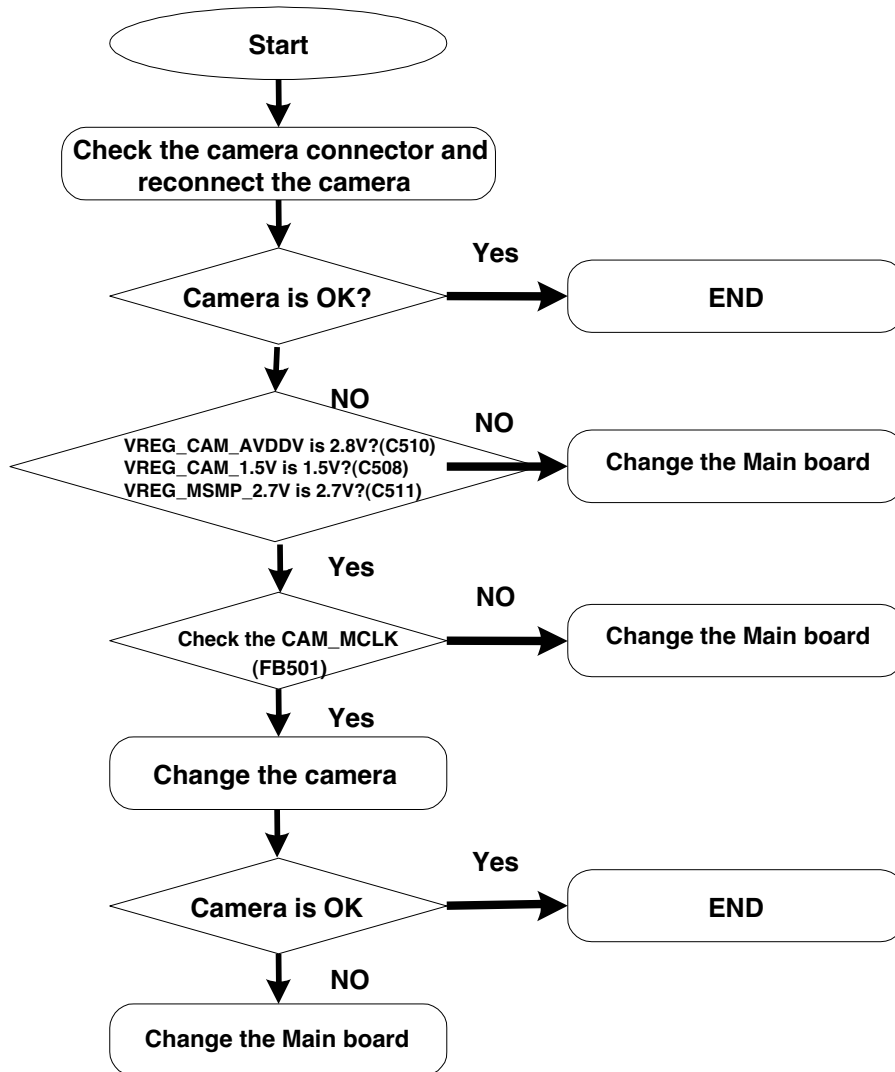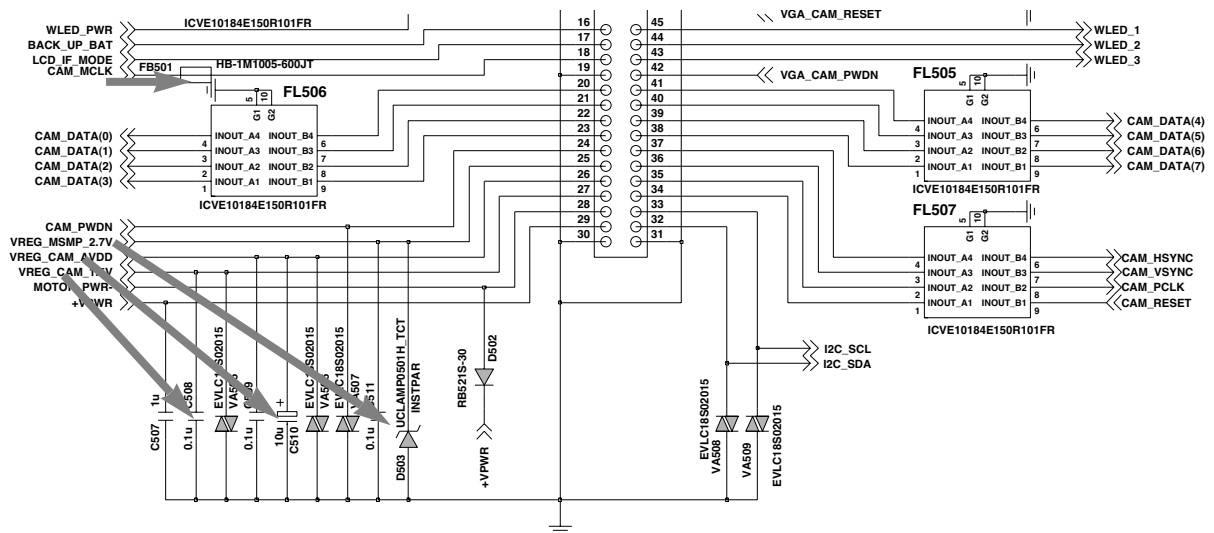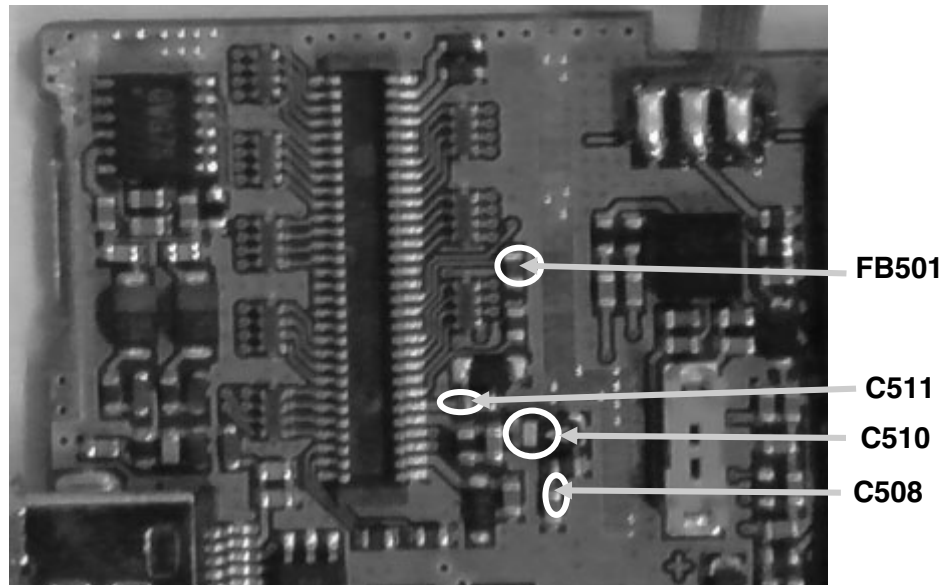
4.11 Keypad Backlight Troubleshooting

Key Pad Back Light is on as below :
Key pressing → KYBD_BACKLIGHT go to 0V → Main LED On

```
                    ┌─────────────┐
                    │    Start    │
                    └──────┬──────┘
                           │
                    ┌──────┴──────┐
                    │  Key press  │
                    └──────┬──────┘
                           │
                        ◇ Signal +VPWR is above 3.2V? ──NO──→  Check battery
                           │ Yes                                      │ Yes
                        ◇ VA613 is 0V ? ──NO──→  Change the Main board
                           │ Yes
                    Change the Main board
```

Start

Key press

Signal +VPWR is above 3.2V? **NO** → **Check battery**

Yes

VA613 is 0V ? **NO** → **Change the Main board**

Yes (from Check battery) → **Change the Main board**

Yes

Change the Main board

VA613   **VPWR**
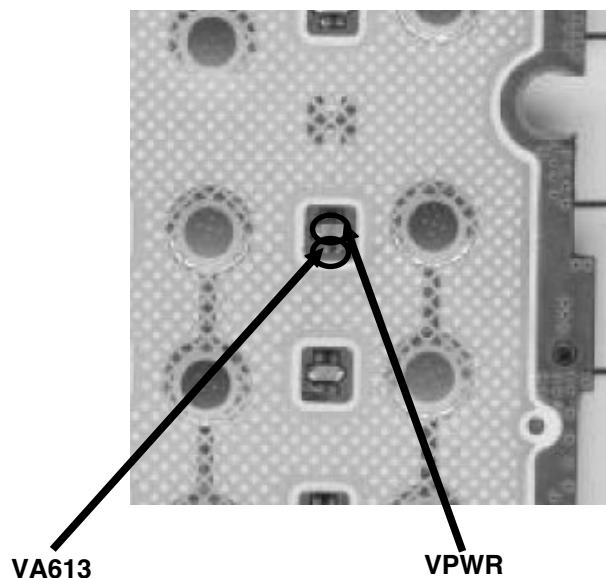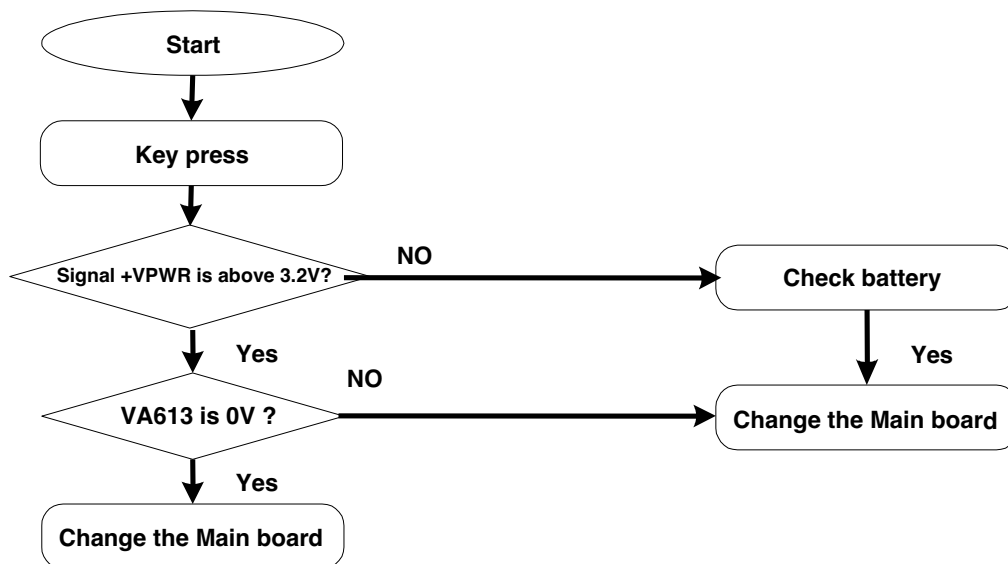
4.12 Folder ON/OFF Troubleshooting

Folder On/Off is worked as below :

Folder On/Off Event → Flip(U600 pin OUT) is triggered(On : about 2.1V, Off : 0V) →
MSM6260 Sense the Folder Event
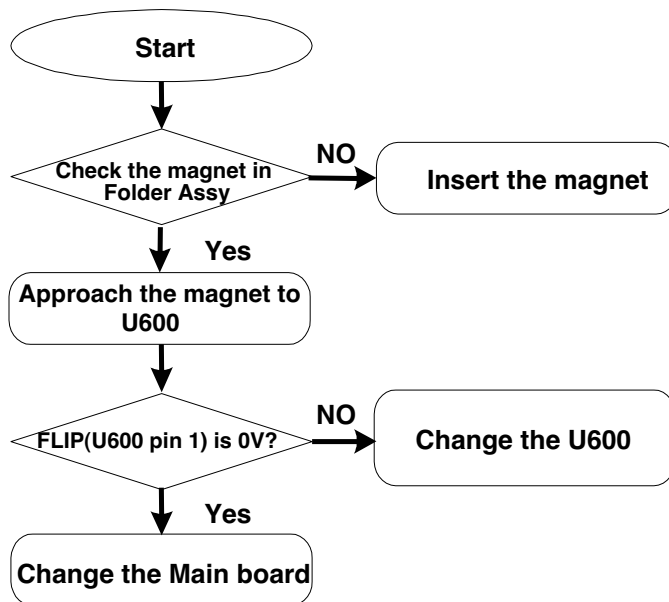
FOLDER_DETECT
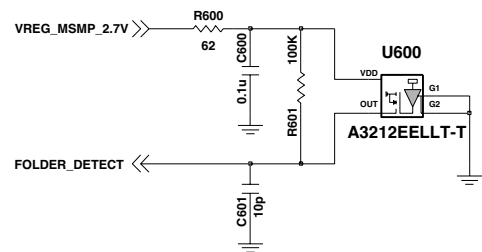
magnet

U600 OUT Pin
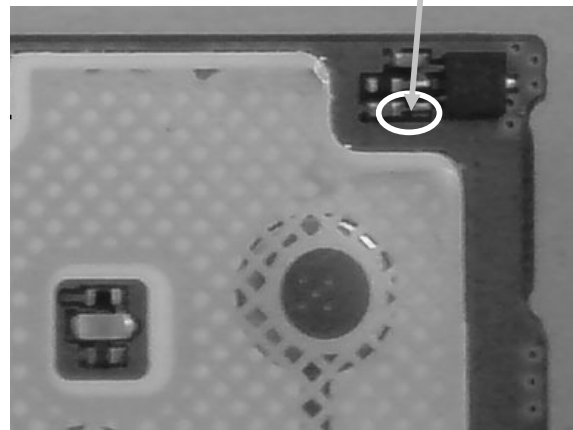
4.13 Main LCD Troubleshooting

Main LCD control signals are generated by MSM6260. The signal path is :

MSM6260 → C0N500 → CN102 → LCD Module

```
                    ┌─────────────┐
                   (    Start      )
                    └──────┬──────┘
                           ▼
                   ┌───────────────┐
                   │ Press END key │
                   └───────┬───────┘
                           ▼
                                      NO
                   ◇ Key LED is on? ─────────▶ ( GO to power on trouble shooting )
                           │
                           ▼ Yes
                   ┌────────────────────────┐
                   │ Disconnect and reconnect│
                   │ The LCD connector(CN500)│
                   └───────────┬────────────┘
                               ▼
                                      Yes
                   ◇ LCD display OK? ─────────▶ ( END )
                           │
                           ▼ No
                   ┌───────────────────────┐
                   │ Change the LCD module │
                   └───────────┬───────────┘
                               ▼
                                      Yes
                   ◇ LCD display OK? ─────────▶ ( END )
                           │
                           ▼ No
                   ┌───────────────────────┐
                   │ Change the Main board │
                   └───────────┬───────────┘
                               ▼
                                      Yes
                   ◇ LCD display OK? ─────────▶ ( END )
                           │
                           ▼ No
                   ┌───────────────────────┐
                   │ Change the LCD FPCB   │
                   └───────────────────────┘
```
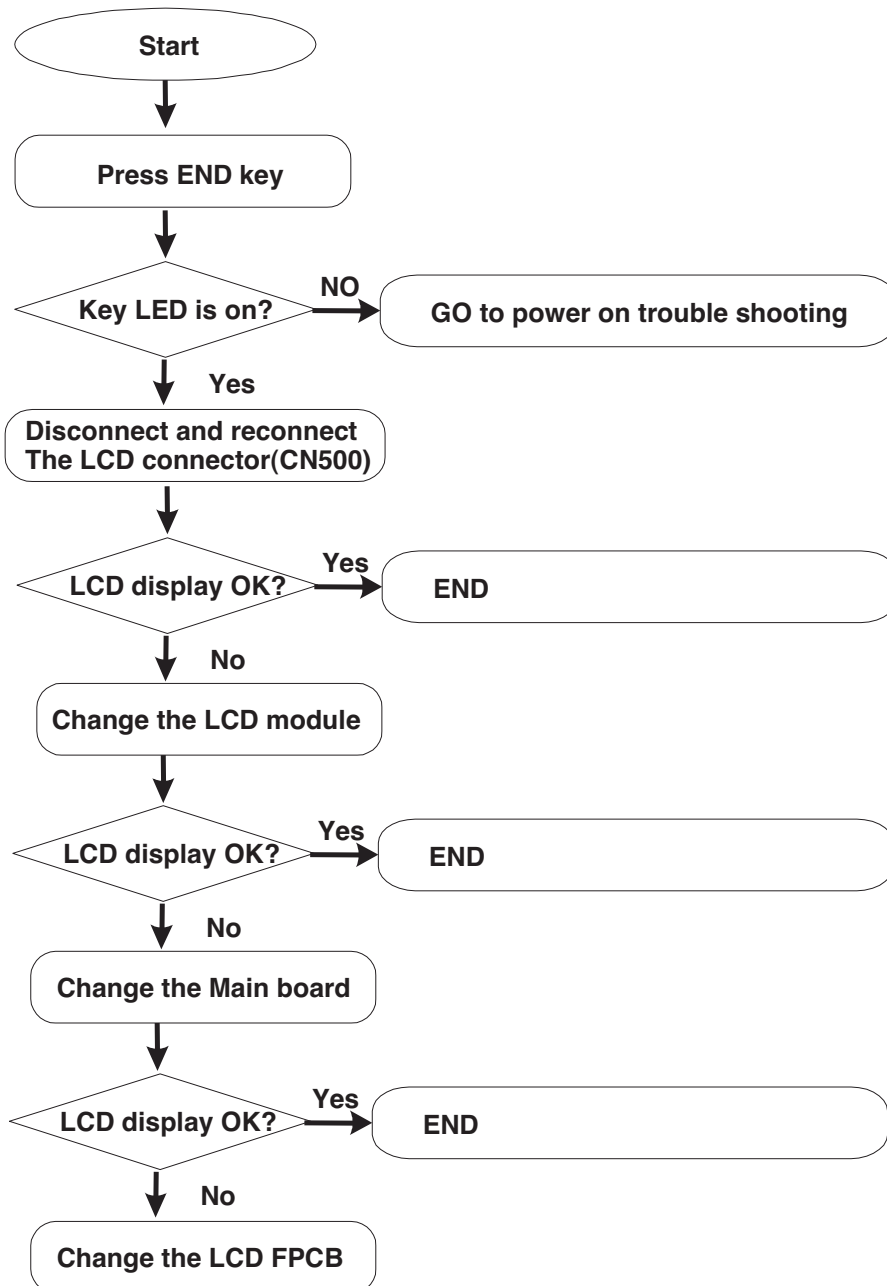
4.14 Receiver Path

MSM6260 EAR1ON/EAR1OP → CN500 → CN102 → Receiver

```
                    ┌─────────────┐
                    │    Start    │
                    └──────┬──────┘
                           │
          ┌────────────────▼────────────────┐
          │ Connect the phone to network    │
          │ Equipment and setup call        │
          │ Setup 1KHz tone out             │
          └────────────────┬────────────────┘
                           │
               ┌───────────▼───────────┐   YES   ┌──────────┐
               │  Can you hear the tone? ├───────►│   END    │
               └───────────┬───────────┘         └──────────┘
                           │ NO
               ┌───────────▼───────────┐   YES   ┌────────────────┐
               │ The sine wave appears │────────►│ Change receiver│
               │ at PIN1,PIN2, CN500?  │         └────────────────┘
               └───────────┬───────────┘
                           │ NO
               ┌───────────▼───────────┐   YES   ┌──────────────────────────┐
               │ The sine wave appears │────────►│ Check LCD FPCB.          │
               │ at PIN1,PIN2, CN500   │         │ Check main/upper connector│
               └───────────┬───────────┘         └──────────────────────────┘
                           │ NO
          ┌────────────────▼────────────────┐
          │      Change the Main board       │
          └──────────────────────────────────┘
```
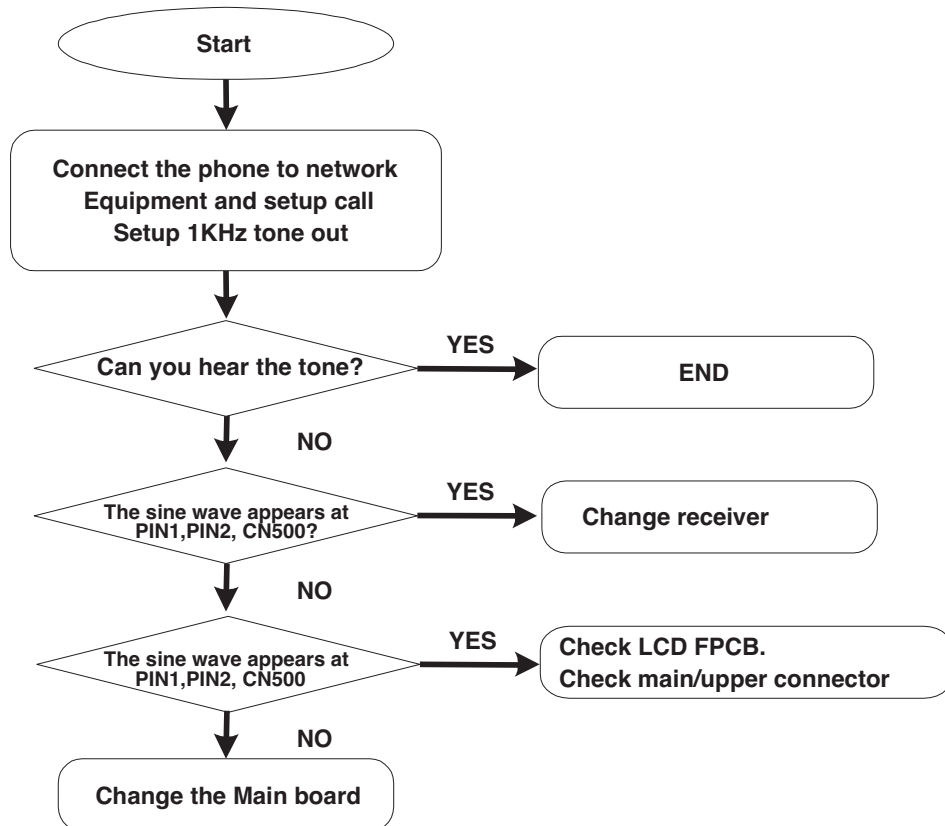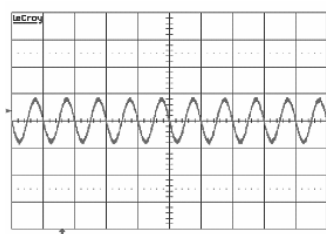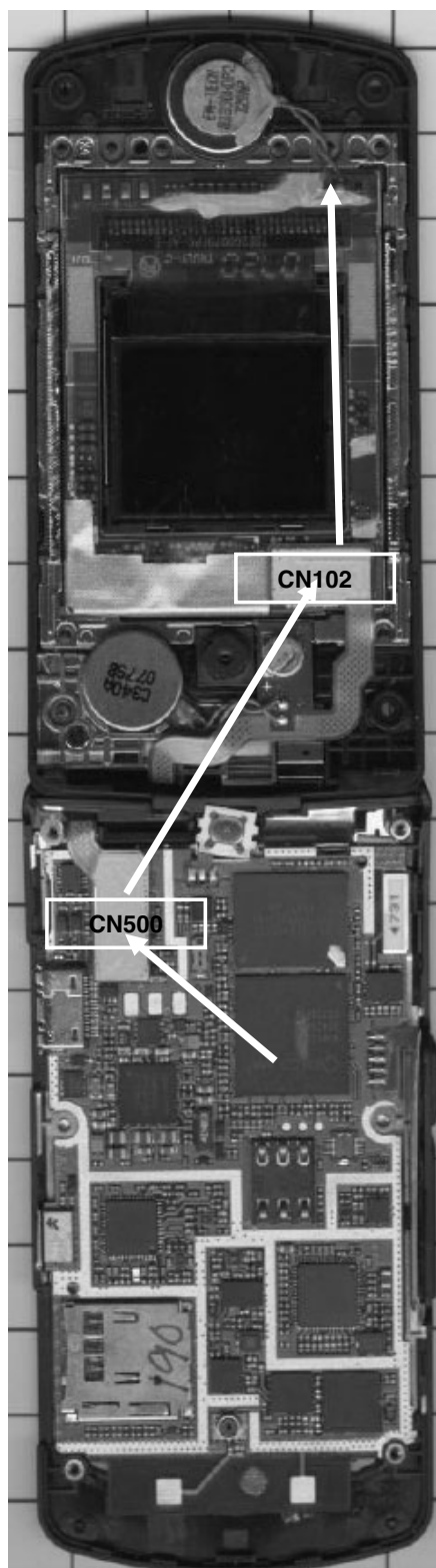
4.15 Headset path

MSM6260 HPH_R, HPH_L → C504/C505 → R504/R505 → CON501(Earjack)

```
                    ┌─────────────┐
                    │    Start    │
                    └─────────────┘
                           │
                           ▼
          ┌──────────────────────────────┐
          │ Connect the phone to network │
          │ equipment and setup call.    │
          │ Setup 1KHz tone out          │
          │ and insert headset.          │
          └──────────────────────────────┘
                           │
                           ▼
                                          YES
          ◇ Can you hear the tone? ──────────────▶  ┌─────────┐
                                                    │   END   │
                           │ NO                     └─────────┘
                           ▼
                                          YES
          ◇ Sine wave appears at ──────────────▶  ┌──────────────────────┐
            R504/R505 ?                           │  Change the Head_Set │
                                                  └──────────────────────┘
                           │ NO
                           ▼
                                          YES
          ◇ Sine wave appears ──────────────▶  ┌──────────────────────┐
            at C504/C505?                      │  Re-solder C504/C505  │
                                               └──────────────────────┘
                           │ NO
                           ▼
          ┌──────────────────────┐
          │ Change the Main board│
          └──────────────────────┘
```
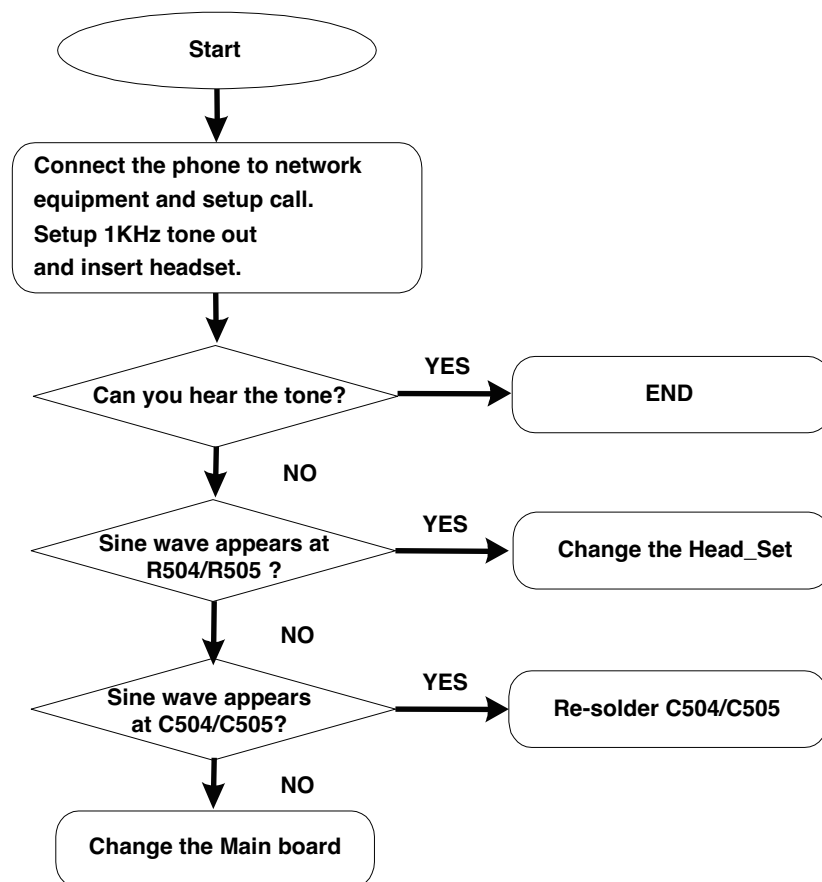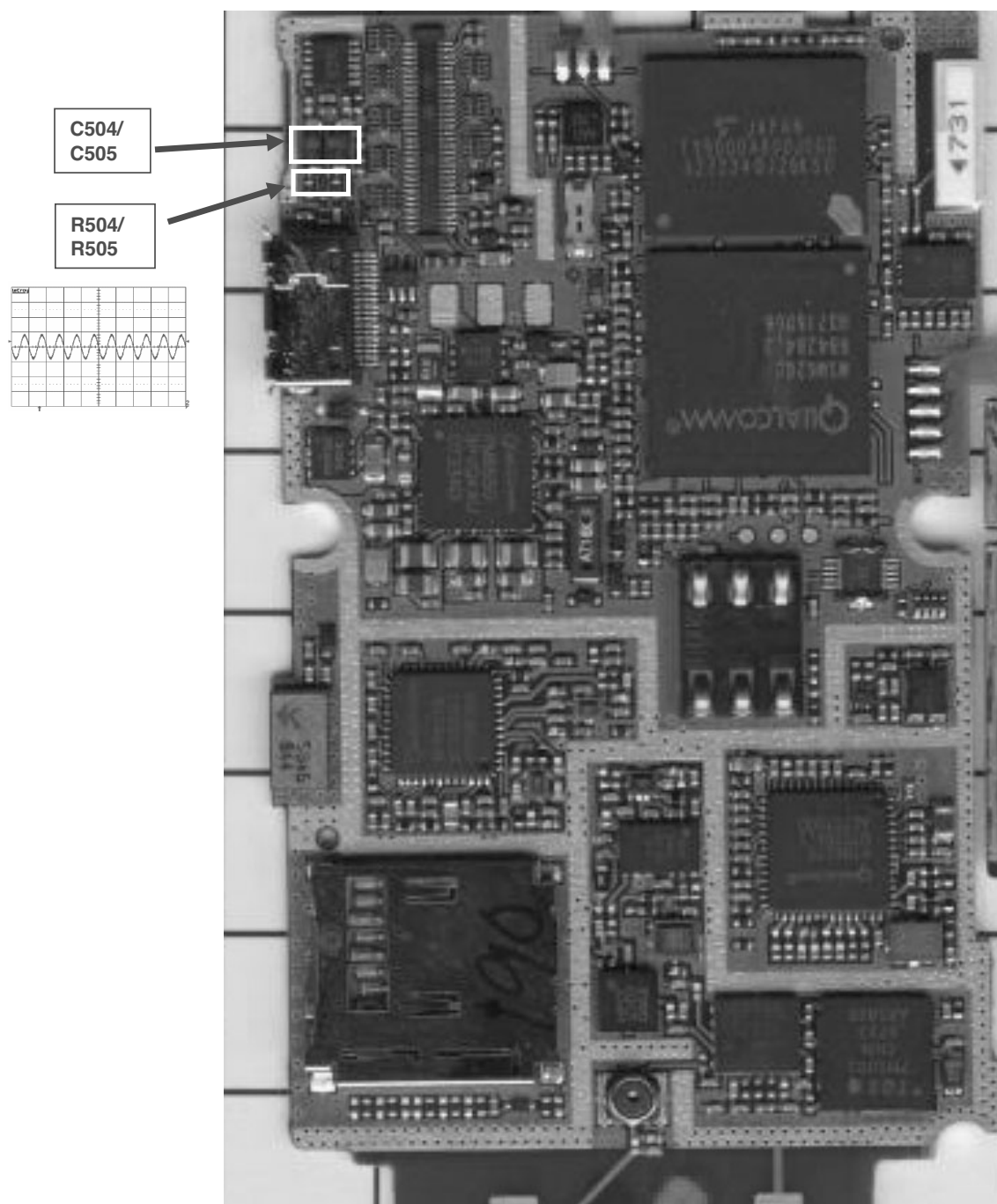
4.16 Speaker phone path

MSM6260 Line_R, Line_L
Audio AMP(U300) → connector → Speaker

```
                    ┌──────────────┐
                    │    Start     │
                    └──────┬───────┘
                           │
                           ▼
          ┌────────────────────────────────┐
          │ Connect the phone to network    │
          │ equipment and setup call        │
          │ Setup 1KHz tone out             │
          └────────────────┬───────────────┘
                           │
                           ▼
              ◇ Sine wave appears at ◇   NO   ┌──────────────────────────────┐
              ◇ C314/R303 and C317/R304? ───→ │ Check C314/R303 and C317/R304 or │
                           │                  │ Change the Main board           │
                        YES│                  └──────────────────────────────┘
                           ▼
              ◇ SPK_AMP_EN(R305) is ◇   NO    ┌──────────────────────┐
              ◇       2.6V?        ◇ ───────→ │ Change the Main board │
                           │                  └──────────────────────┘
                        YES│
                           ▼
              ◇ Sine wave appears at ◇   NO   ┌──────────────────────┐
              ◇        SPK+         ◇ ──────→ │ Change the Main board │
                           │                  └──────────────────────┘
                        YES│
                           ▼
              ◇ Connecting speaker OK? ◇  NO  ┌──────────────────────┐
                           │           ─────→ │ Re-connect speaker    │
                        YES│                  └──────────────────────┘
                           ▼
              ◇ Can you hear the tone? ◇  NO  ┌──────────────────────┐
                           │           ─────→ │ Change the speaker    │
                        YES│                  └──────────────────────┘
                           ▼
                    ┌──────────────┐
                    │     END      │
                    └──────────────┘
```

Speaker AMP block

SPK+

4.17 Main microphone

MIC300 → C302,C303 → MIC1P,MIC1N(MSM6260)

MIC

MIC300
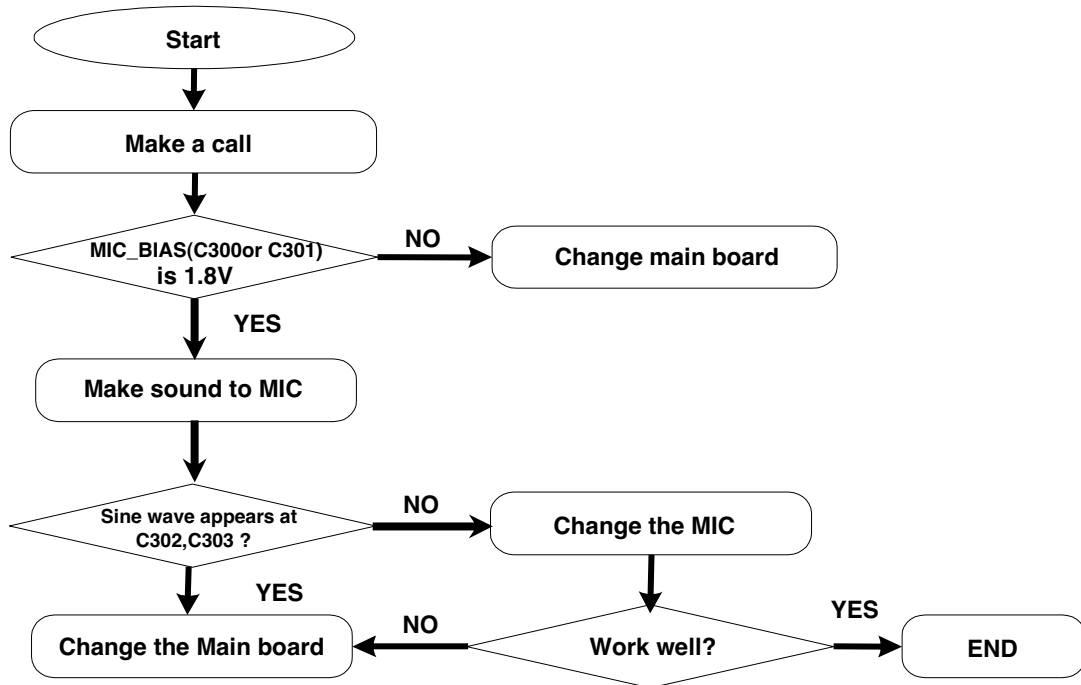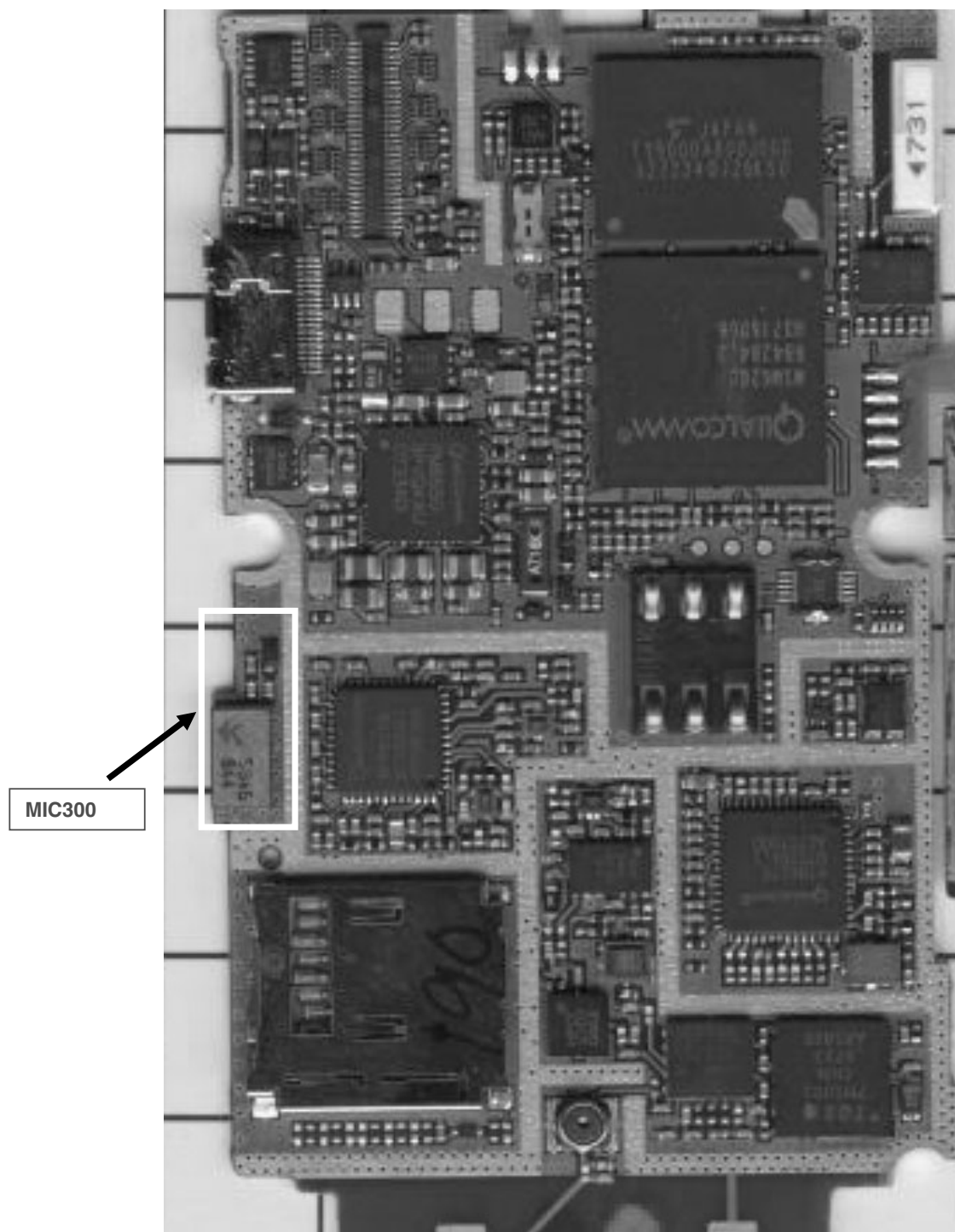
4.18 Headset microphone

Headset → C207 → MIC2P(MSM6260)

```
                      ┌─────────────┐
                      │    Start    │
                      └──────┬──────┘
                             │
                      ┌──────▼──────┐
                      │ Make a call │
                      └──────┬──────┘
                             │              OK
          ┌──────────────────▼──────┐      ┌─────────────┐
          │ Change the headset and  ├─────►│     END     │
          │         retry           │      └──────▲──────┘
          └──────────┬──────────────┘             │ YES
                     │ NO                          │
              ┌──────▼──────┐   NO        ┌────────┴────────┐
              │ EAR_SENSE_N ├────────────►│ Change the MAIN │
              │ (R624) is 0V?│            │      board       │
              └──────┬──────┘             └─────────────────┘
                     │ Yes
              ┌──────▼──────┐   NO        ┌─────────────────┐
              │ Sine wave   ├────────────►│ Change the      │
              │ appears at  │             │ headset or      │
              │ C207 ?      │             │ Main board and  │
              └──────┬──────┘             │ retry           │
                     │ Yes                └─────────────────┘
              ┌──────▼──────┐
              │ Change the  │
              │ Main B'd    │
              └─────────────┘
```
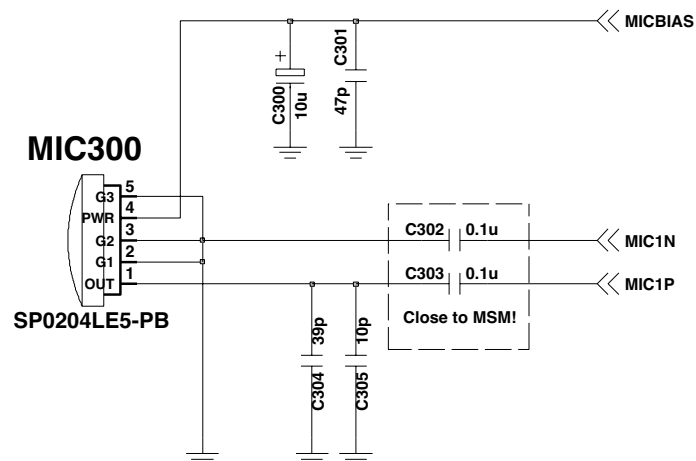
4. TROUBLE SHOOTING
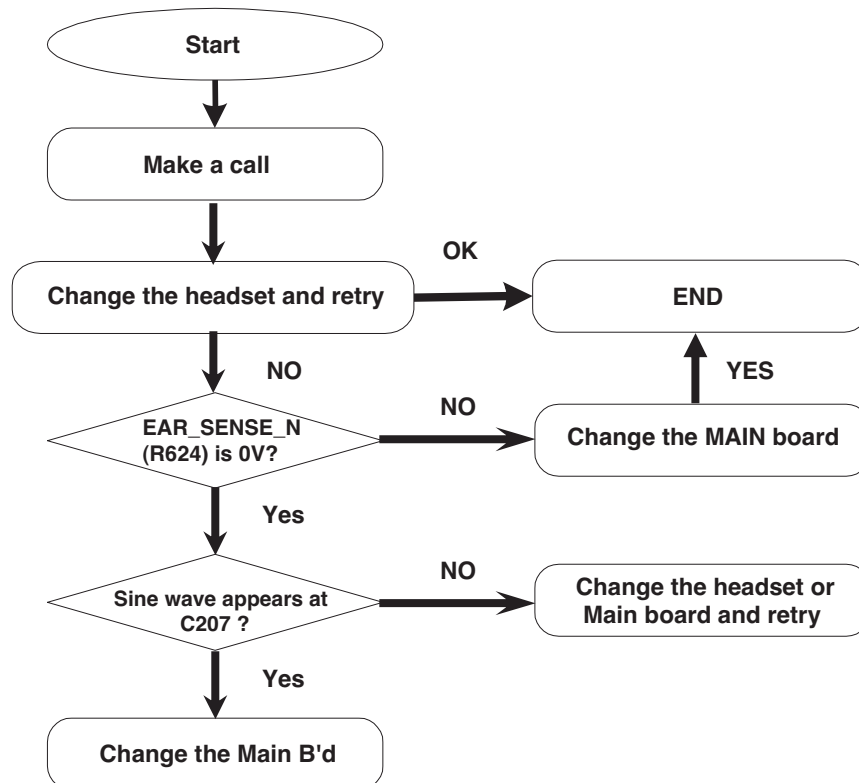
4.19 Vibrator

PM6650 Motor_ PWR- Go to 0V → LCD FPCB → Motor

```
        Start
          │
          ▼
  Operate the Vibrator
          │
          ▼
    Motor_PWR(-)      NO      Change the MAIN board or
     is 0V?    ──────────►      Check the LCD FPCB
          │ YES
          ▼
    Change vibrator
```

Motor_PWR-

USB_D+   18 USB_D_P
USB_SE0   19 USB_SE0
USB_D-   20 USB_D_M
             21 GP1_DRV_N(MPP7)

R412 47K   C427 4.7u 1608

LCD_DRV_N   22
KPD_DRV_N   23
KPDPWR_N   24
VIB_DRV_N   25
RUM_IO(MPP12) 26
VSW_PA   27
VREG_PA   28

KYBD_BACKLIGHT
PM_ON_SW_N
MOTOR_PWR-
USIM_P_DATA

Switcher Circuit for RF

L400 4.7uH

VREG_RF_SMPS   R416 0

2012 C432 22u C433 0.1u
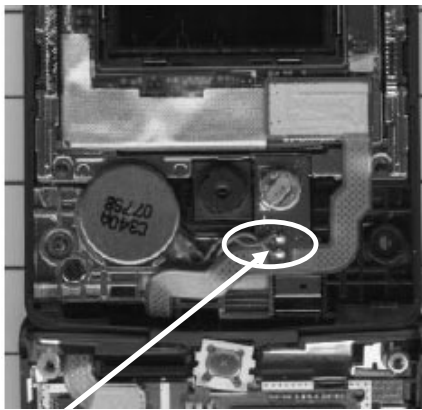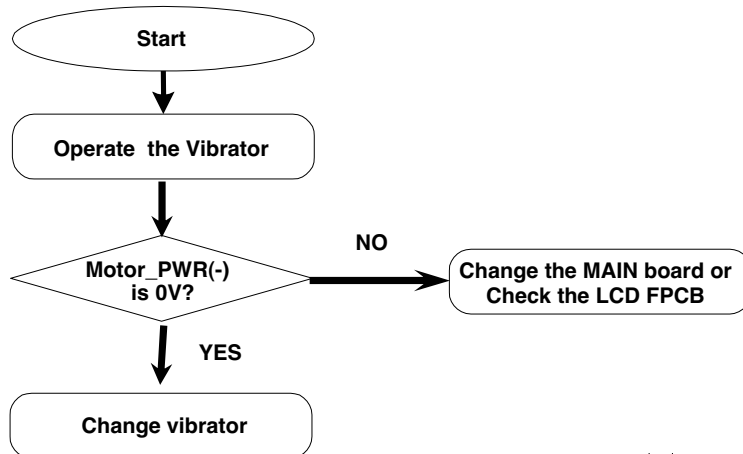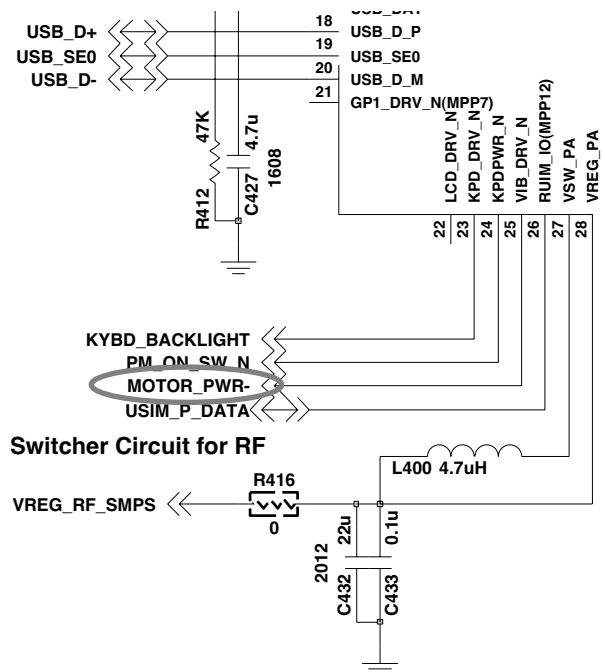
5. DOWNLOAD

5.1 Introduction

LGMDP is a LGE application that allow users to download images from PC to handset.

LGMDP is a download tool with capabilities to upload image files to the handset.

LGMDP is designed to be simple to use and easy enough for the beginner to upload executable images to the handset. LGMDP supports Windows 2000/XP where the LG (Ver 4.6 or later) USB modem driver is installed. Additionally, LGMDP allows multi downloading up to 8 handsets at the same time.

5.2 Downloading Procedure

1) Setup Preferences

Connect the phone to your desktop PC using the USB cable and run the LGMDP application. Before getting started, set up LGMDP preferences from the Preferences of the file menu the way you want. Click on the File menu and select.

Preferences.

➢ **Play a success sound**
   This is an experimental feature. To enable this simply check the box. It will be played a .wav file when the download has been completed.

➢ **Automatically run "Select Port" When LGMDP starts**
   This option is designed to give user convenient. When LGMDP starts, it will automatically select "Select Port" button to download new image file.

➢ **Always on Top**
   Check if LGMDP always appears at the top of the window so that user can monitor it all the time.

➢ **Windows Size**
   If you want to change program window size, change this option.

➢ **XML Log Path**
   You can change the directory path that XML log files are saved.
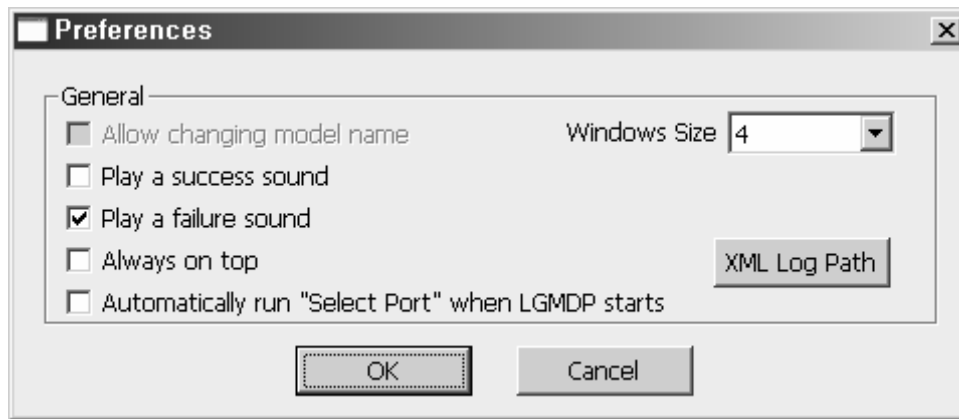
5. DOWNLOAD

2) Connecting to PC

Click on the Select Port and then Select Port window will be pop up. Check if state shows Enable for the port to be connected for downloading images. Then click on the Connect button.

(The port number(COM7) and model name shall be different from that of the port number in the snapshot.)
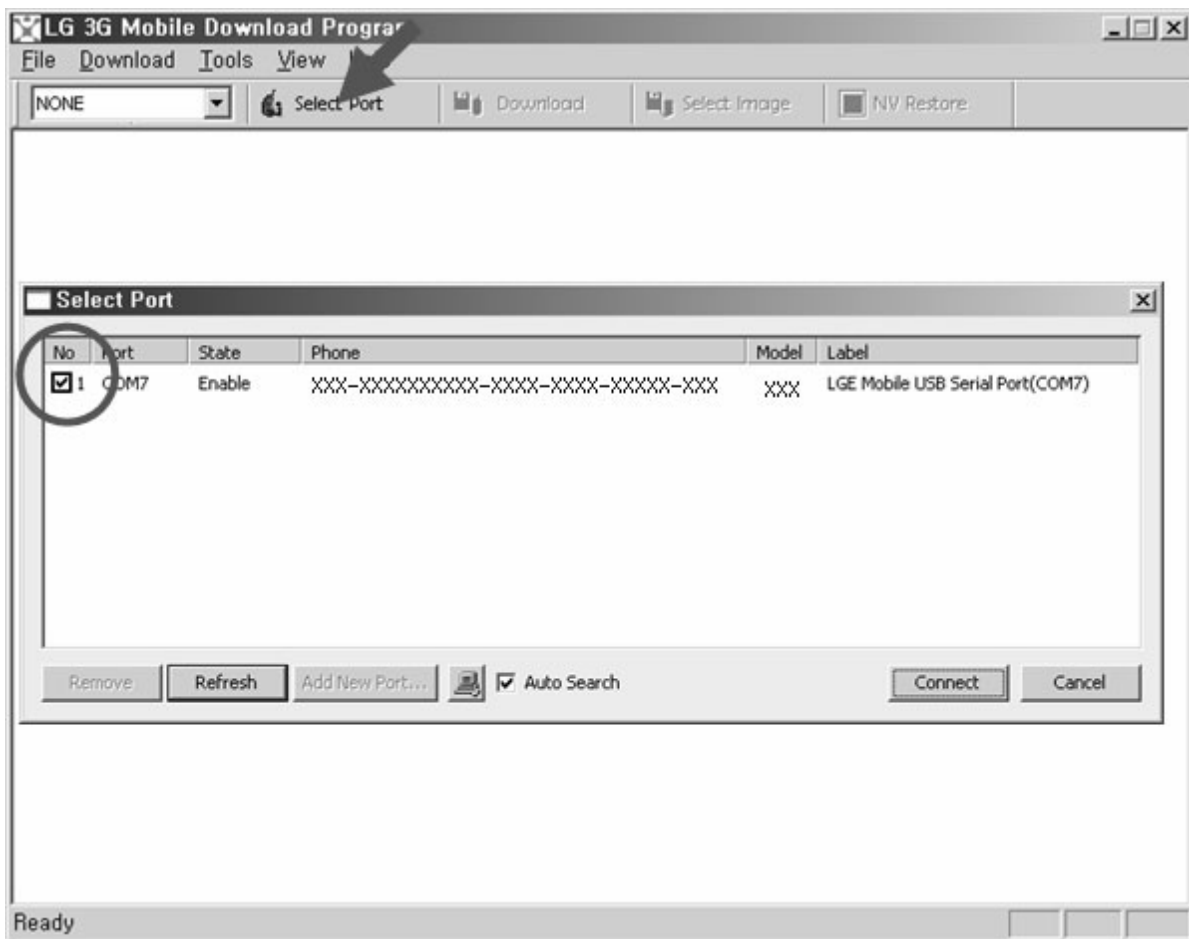
The status Ready is displayed when the application is ready for downloading. While the images are transmitted from PC to the handset, a progressive bar (Red box) indicating the degree of transmission of data is displayed.
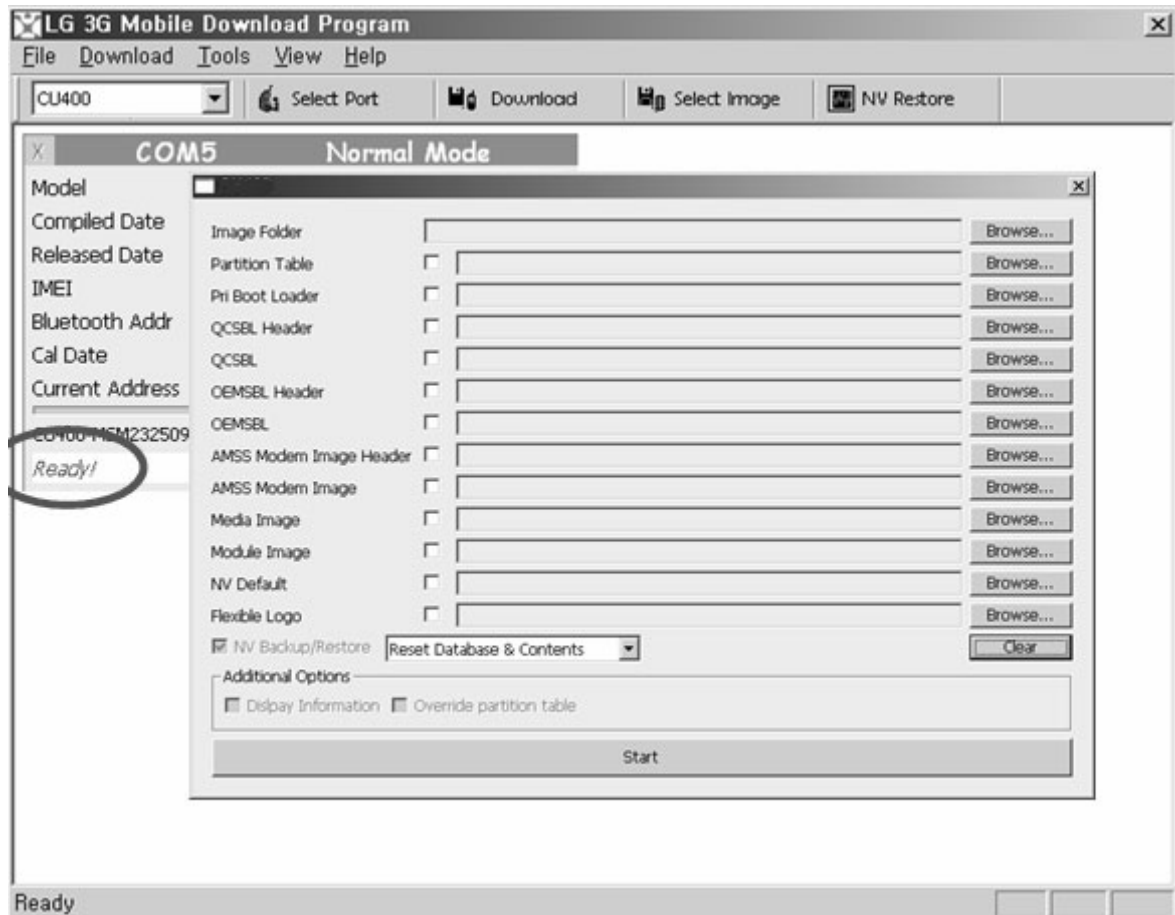
5. DOWNLOAD

The following slide describes how to use or set options in detail.

(The model name shall be different from that of the model name in the snapshot.)

1) Image Folder indicates loot path where all image files are placed. To change location of the default image path, select Browse... button. The edit box shows the file path where new images are located. Please note that all images should be located in a selected folder. (This program support the automatically loading image for some models based on MSM6275 ,MSM6280, MSM6260, MSM6245)

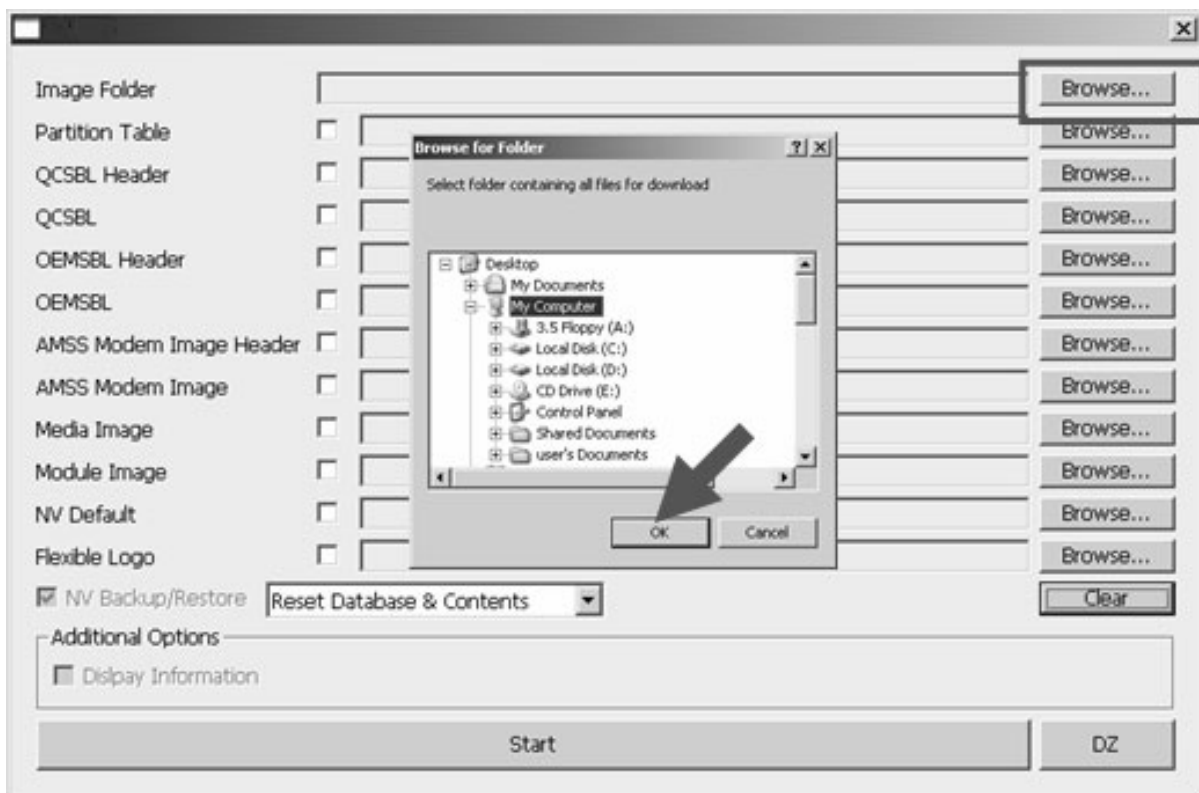2) Click on the Browse... button to select image files to be downloaded on the handset.

3) **NV Backup/Restore:** NV Backup/Restore always have to be done, and it is default selected option. Backup the NV data and restore the backed up NV data automatically.

4) **Reset database & Contents:** User related data including the setting data on the EFS is reset in the handset. The contents in the handset will be erased.

   Erase_EFS: The calibration data, user contents, media, and module are erased. Only calibration data is kept when NV backup/restore is checked.

   Keep All Contents: Maintain user data including WAP, AD, DRM, Email, Play lists, images When downloading a new images, user data stated above are maintained if this option is enable.

5) **Additional Options:**

   Display Information is defauly not selected and user cannot choose.

   Security: The security option is automatically selected based on the selected country when security box is selected.

   ➢ Integrity is selected when the selected country is UK, Italy, Hong Kong, Austria, or Israel.

   ➢ Ciphering is not applied or used for H3G user.

   ➢ Fake Security is not applied or used for H3G user.

   ➢ Integrity + Ciphering is selected when the selected country is Australia, Sweden, or Denmark.

Please note that user cannot select the options stated above on the security

6) **Clear:** Clearing all directory paths of images in the dialog.

7) **Start:** Starting downloading the selected individual image.

3) Starting downloading the selected individual image.

Select the image folder, where all the image files are located, by clicking on the Browse... button. (The folder name shall be different from that of the folder name in the snapshot. The folder name indicates the path where the image files are located.)

★ if you select the image folder, the program will automatically load images accordingly.
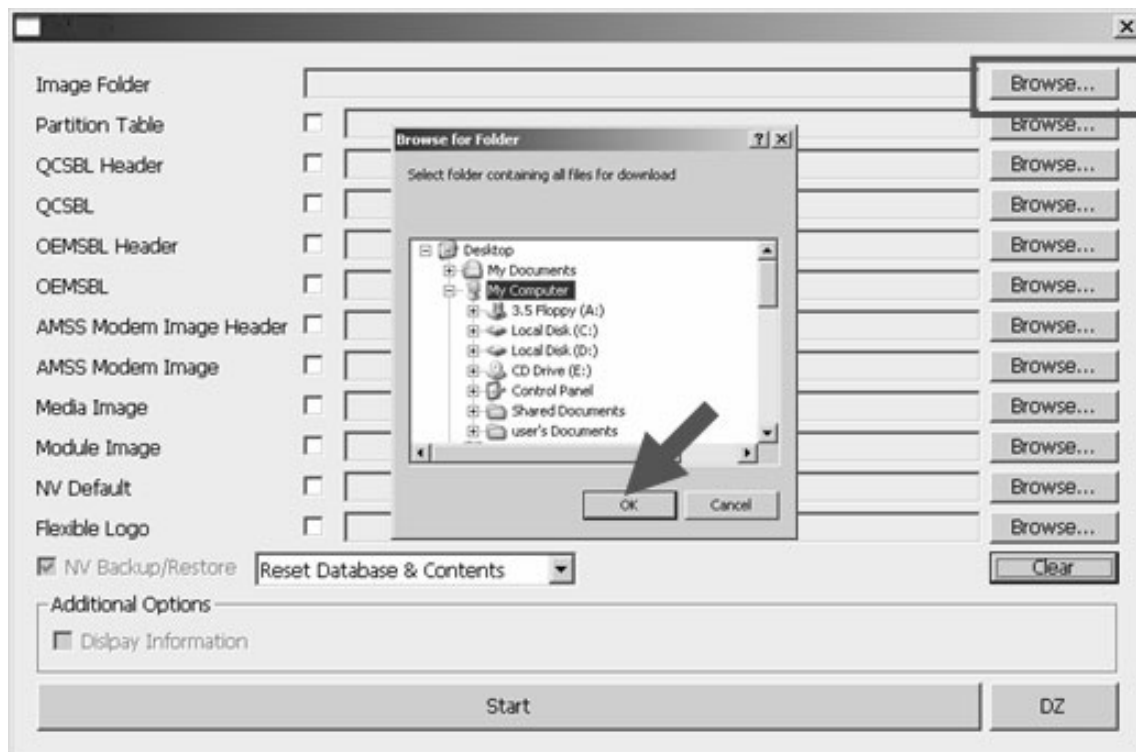
★ iif you select the image folder, the program will automatically load images accordingly.

Image Folder	D:\image\XXXXX	Browse...
Partition Table	☑ D:\image\XXXXX\partition.mbn	Browse...
QCSBL Header	☑ D:\image\XXXXX\qcsblhd_cfgdata.mbn	Browse...
QCSBL	☑ D:\image\XXXXX\qcsbl.mbn	Browse...
OEMSBL Header	☑ D:\image\XXXXX\oemsblhd.mbn	Browse...
OEMSBL	☑ D:\image\XXXXX\oemsbl.mbn	Browse...
AMSS Modem Image Header	☑ D:\image\XXXXX\amsshd.mbn	Browse...
AMSS Modem Image	☑ D:\image\XXXXX\amss.mbn	Browse...
Media Image	☑ D:\image\XXXXX\XXXXX-MEDIA-XXXX-XXX-XX-2007-XXX-XX.bin	Browse...
Module Image	☑ D:\image\XXXXX\XXXXX-MODULE-XXX-XXX-XX-2007-XXX-XX.bin	Browse...
NV Default	☐	Browse...
Flexible Logo	☑ D:\image\XXXXX\booting_logo.flb	Browse...
☑ NV Backup/Restore	Reset Database & Contents ▼	Clear

Automatically load images

Additional Options
☐ Dislpay Information

Start	DZ
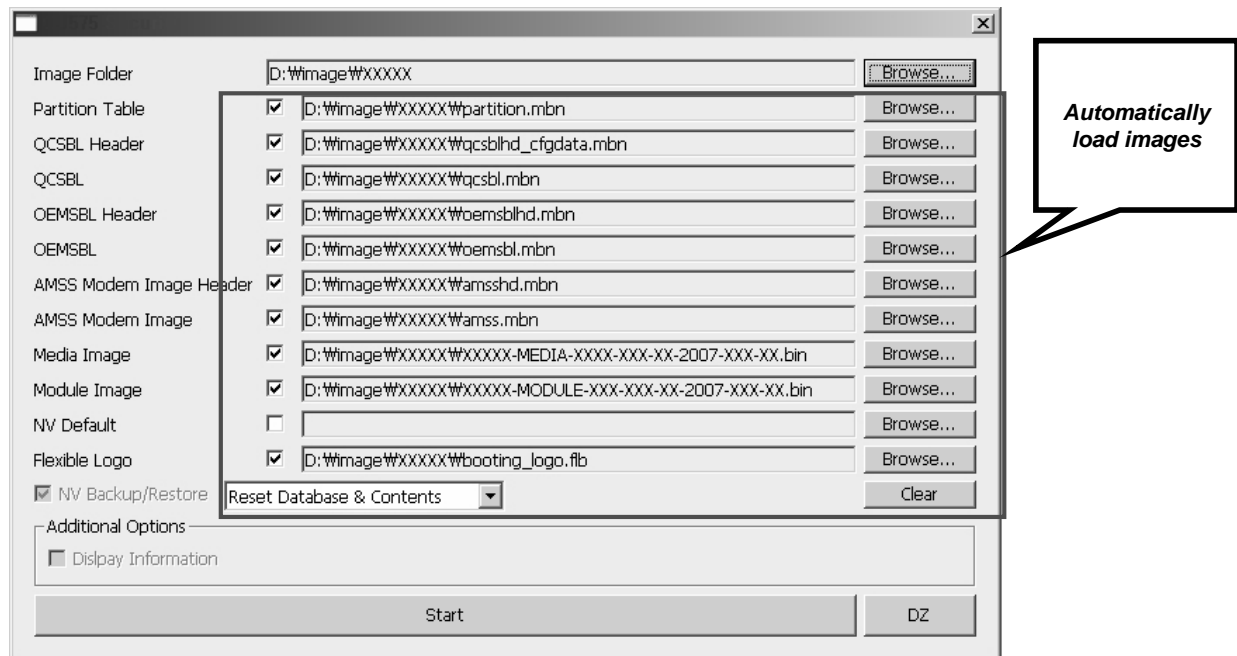
5. DOWNLOAD

If NV restore is failed, then the NV Data(*.nv2) is erased permantly. In this case, choose the desired NV file to be downloaded on the handset. To enable this simply check the box or select the NV file from the LGMDP installation directory by clicking on the Browse... button.

Field		Path	
Image Folder		D:\image\XXXXX	Browse...
Partition Table	☑	D:\image\XXXXX\partition.mbn	Browse...
QCSBL Header	☑	D:\image\XXXXX\qcsblhd_cfgdata.mbn	Browse...
QCSBL	☑	D:\image\XXXXX\qcsbl.mbn	Browse...
OEMSBL Header	☑	D:\image\XXXXX\oemsblhd.mbn	Browse...
OEMSBL	☑	D:\image\XXXXX\oemsbl.mbn	Browse...
AMSS Modem Image Header	☑	D:\image\XXXXX\amsshd.mbn	Browse...
AMSS Modem Image	☑	D:\image\XXXXX\amss.mbn	Browse...
Media Image	☑	D:\image\XXXXX\XXXXX-MEDIA-XXXX-XXX-XX-2007-XXX-XX.bin	Browse...
Module Image	☑	D:\image\XXXXX\XXXXX-MODULE-XXX-XXX-XX-2007-XXX-XX.bin	Browse...
NV Default	☐		Browse...
Flexible Logo	☑	D:\image\XXXXX\booting_logo.flb	Browse...

☑ NV Backup/Restore Reset Database & Contents ▼ Clear

Additional Options
☐ Dislpay Information

Start	DZ

Click on the **START** button to start downloading.
Normally LGMDP will downloaded all files that need downloading. To download selected image file only simply select the image file that user want to process downloading.

4) Downloading

The following flow chart is whole process for downloading images to the handset. You will see snapshots for each step in the succeeding slides.

```
        Download Start

  NV backup      NV restore      Erase MEDIA directory

  Erase MODULE directory          Download MEDIA

  EFS Erase                       Download MODULE

  Download PBL and QCSBL          Reset

  Download OEMSBL

  Download MODEM                  Download End

  Reset
```

<Download process>

5. DOWNLOAD

NV_XXXXX_2007XXXX_XXXXXX.nv2

This file is created at this program's sub directory.
The sub directory's name is IMEI(123456-78-123456).
You can select this file, when execute "NV Restore"

It will be backup after 4 seconds

[NV Backup]   [Cancel]

• This message box informs that a new file for NV backup will be created in the displayed file name in the LGMDP installation directory.

X	COM5	Normal Mode
Model		
Compiled Date	Oct 12 2006 10:16:07	
Released Date	Sep 26 2006 24:00:00	
IMEI	NOT_ACTIVE_____	
Bluetooth Addr	NOT_ACTIVE_____	
Cal Date	NOT_ACTIVE_____	
NV Item	NV ITEM	

...V00-MCP...92509C-V09a-Oct-08-2006-CW-US   00:08.6 Sec
NV BACKUP ...
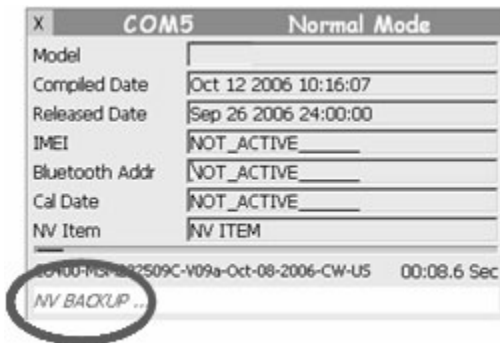
• Backing up NV data and backed up NV data will be stored in the LGMDP installation directory.

X	COM4	Normal Mode
Model		
Compiled Date	Jul 14 2005 18:33:13	
Released Date	JUL 3 2005	
IMEI	NOT_ACTIVE_____	
Name	Btsearch.pxo	
Type	File	
Size	21,550	

...00-MCP...6290_V08d_JUL-14-2005-H3G-HK   00:08.6 Sec
ERASE MODULE.
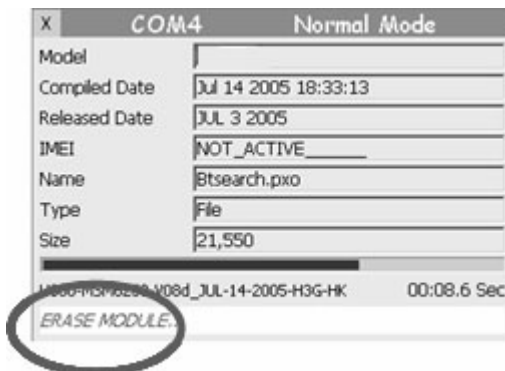
• Erasing the existing directories and files before the Module image is downloaded.

X	COM5	Normal Mode
Model		
Compiled Date	Oct 12 2006 10:16:07	
Released Date	Sep 26 2006 24:00:00	
IMEI	NOT_ACTIVE_____	
Start Address		
Stop Address		
Current Address		

CL...-MCP...32507...V09a-Oct-08-2006-CW-US   01:05.2 Sec
AMSS MODEM RAM WRITING ...
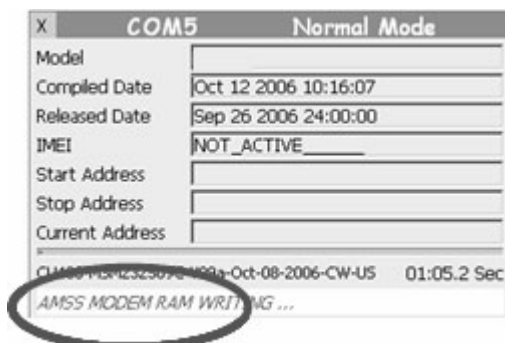
• Downloading the AMSS modem image.

- Rebooting the handset and re-establishing the connection.
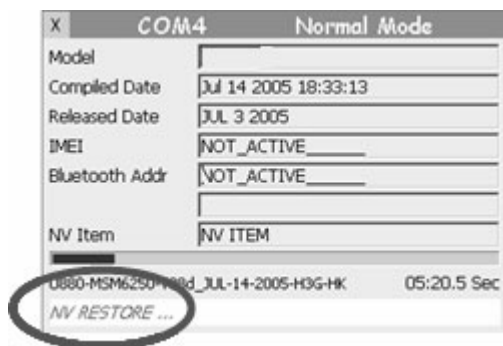
- Restoring NV data which backed up in the Backing up process. User can also restore NV data using NV Default image selection.
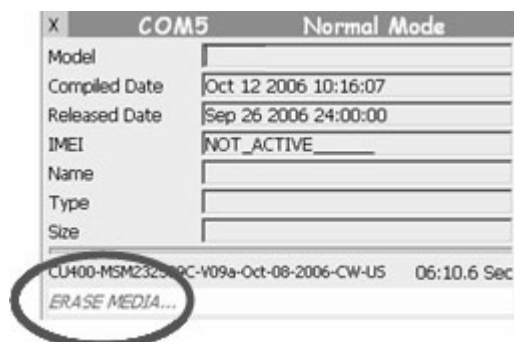
- Erasing the existing directories and files before downloading the selected Media image.
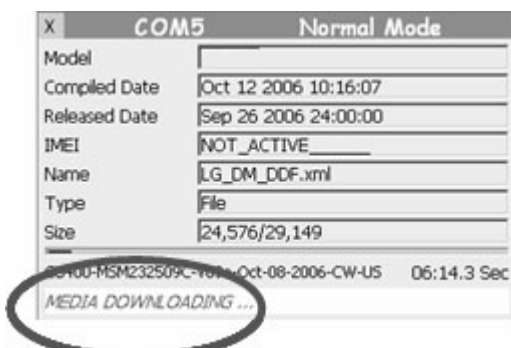
- Downloading Media image in progress.

5. DOWNLOAD

• Downloading Module image in progress.

• Downloading process has completed successfully.

5) Tools

Device Manager allows to monitor current hardware that is installed on your PC.

Device Manager is designed to monitor USB connectivity and check where the COM has been installed . Select Device Manager from the Tools of the file menu.
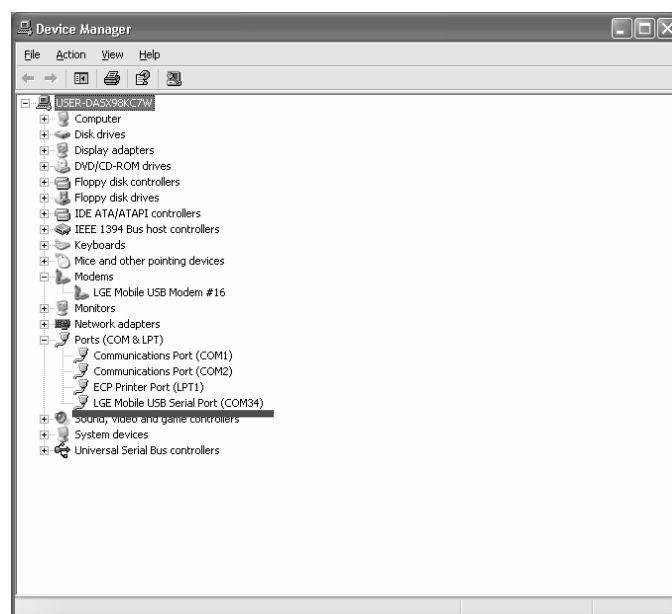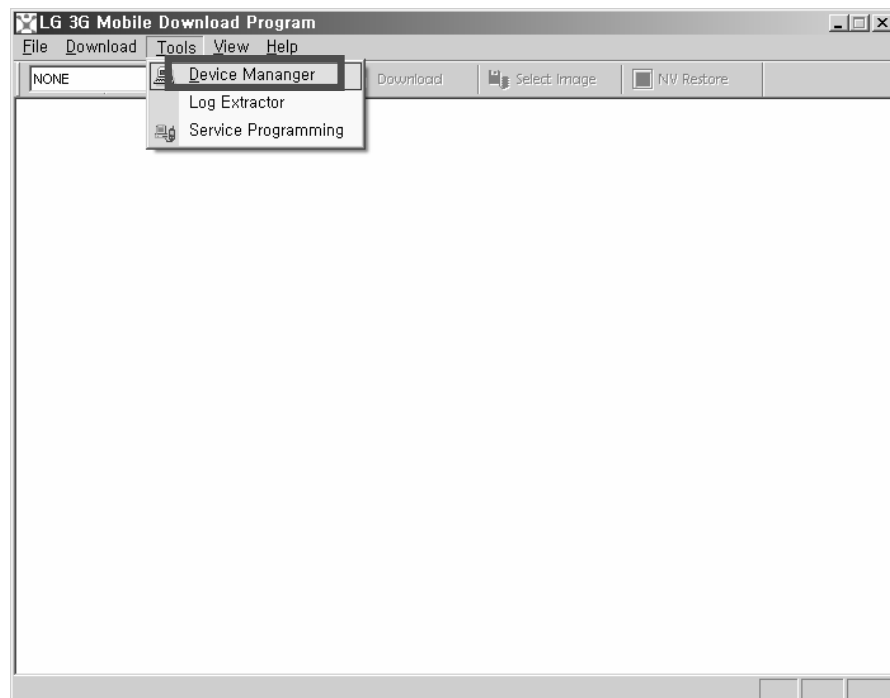
5. DOWNLOAD

Log Extractor is designed to extract log information from handset and store log related files in the selected root path in PC. This function is very useful for debugging. Select Log Extractor from the Tools of the file menu, and connect the phone with LGMDP by clicking on the Connect button. When clicking on the Connect button, this checks if the appropriate files such as LFAPP/RecMngr.bin, err directory, Debugging_Tip.txt, or Hidden_info.bin are placed on the handset. If they are exist, then appropriate check boxes are checked accordingly. Select directory to store log files by clicking on the ... button.
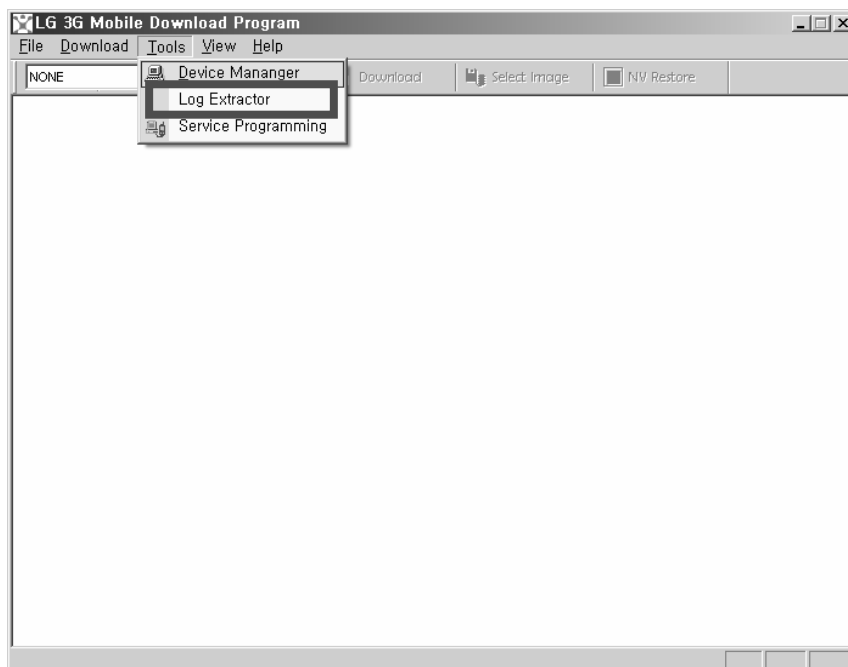
5.3 Troubleshooting Download Errors

1) When the phone does not work

→ Reboot the phone as the emergency mode (keep pressing "2" and "5" key while the phone is being booted). and then try to download the images again.

★ The phone supports a special mode named emergency mode. In this mode, minimum units for downloading is running so that users can download the images again in case of emergency situation. (AMSS Modem, Media and Module Images don't be running in this mode.)
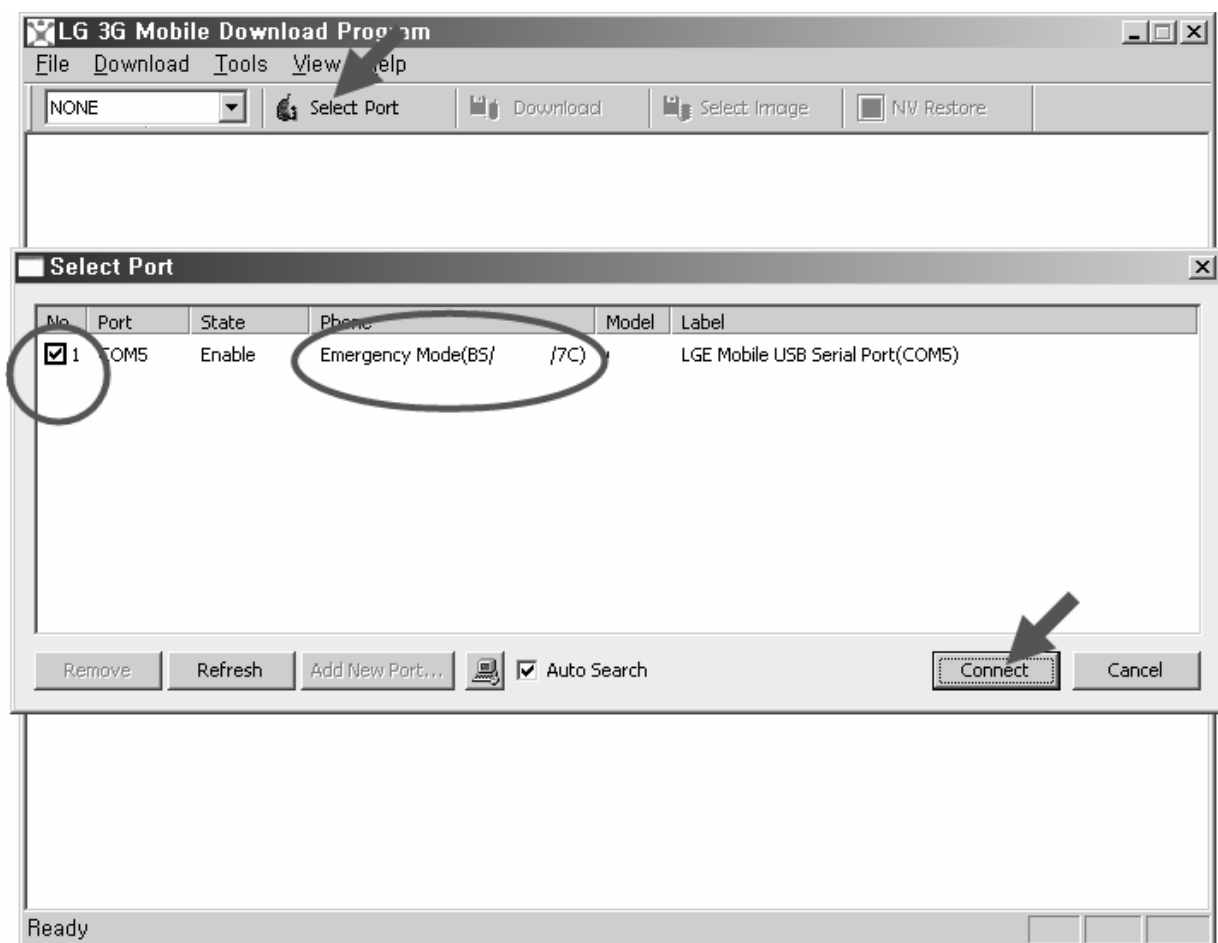
2) NV Restore error

When you meet the "NV Restore error",
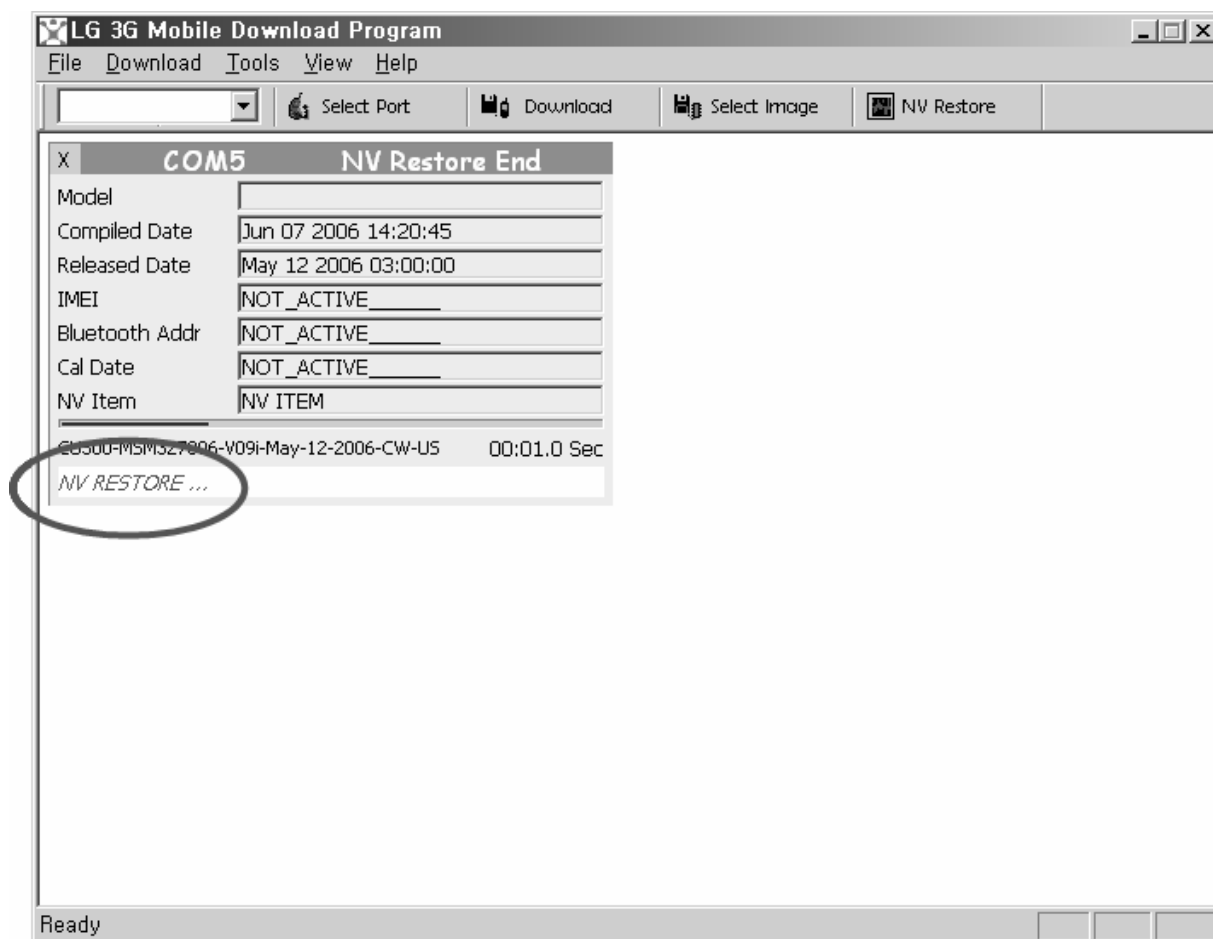
→ Connect to the phone.
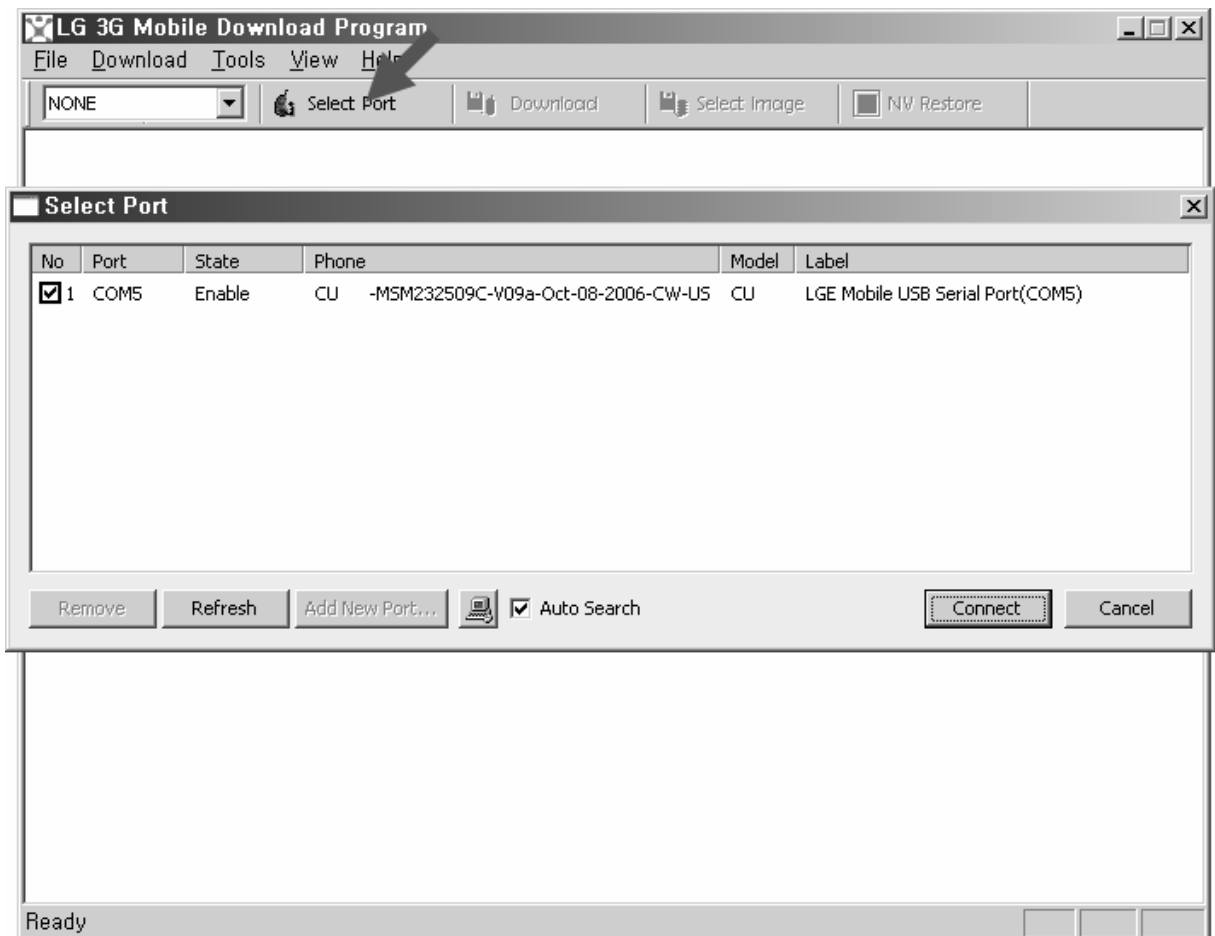
5. DOWNLOAD

→ Click on 'Cancel'.

Image Folder		D:\image\XXXXX	Browse...
Partition Table	☑	D:\image\XXXXX\partition.mbn	Browse...
QCSBL Header	☑	D:\image\XXXXX\qcsblhd_cfgdata.mbn	Browse...
QCSBL	☑	D:\image\XXXXX\qcsbl.mbn	Browse...
OEMSBL Header	☑	D:\image\XXXXX\oemsblhd.mbn	Browse...
OEMSBL	☑	D:\image\XXXXX\oemsbl.mbn	Browse...
AMSS Modem Image Header	☑	D:\image\XXXXX\amsshd.mbn	Browse...
AMSS Modem Image	☑	D:\image\XXXXX\amss.mbn	Browse...
Media Image	☑	D:\image\XXXXX\XXXXX-MEDIA-XXXX-XXX-XX-2007-XXX-XX.bin	Browse...
Module Image	☑	D:\image\XXXXX\XXXXX-MODULE-XXX-XXX-XX-2007-XXX-XX.bin	Browse...
NV Default	☐		Browse...
Flexible Logo	☑	D:\image\XXXXX\booting_logo.flb	Browse...

☑ NV Backup/Restore   Reset Database & Contents ▼   Clear

Additional Options
☐ Dislpay Information

Start	DZ

Ready

→ Click on 'NV Restore' then several NV Backup files(*.nv2) are shown.

★ The files are saved every NV Backup. The name is based on the time when NV Backup is done.)
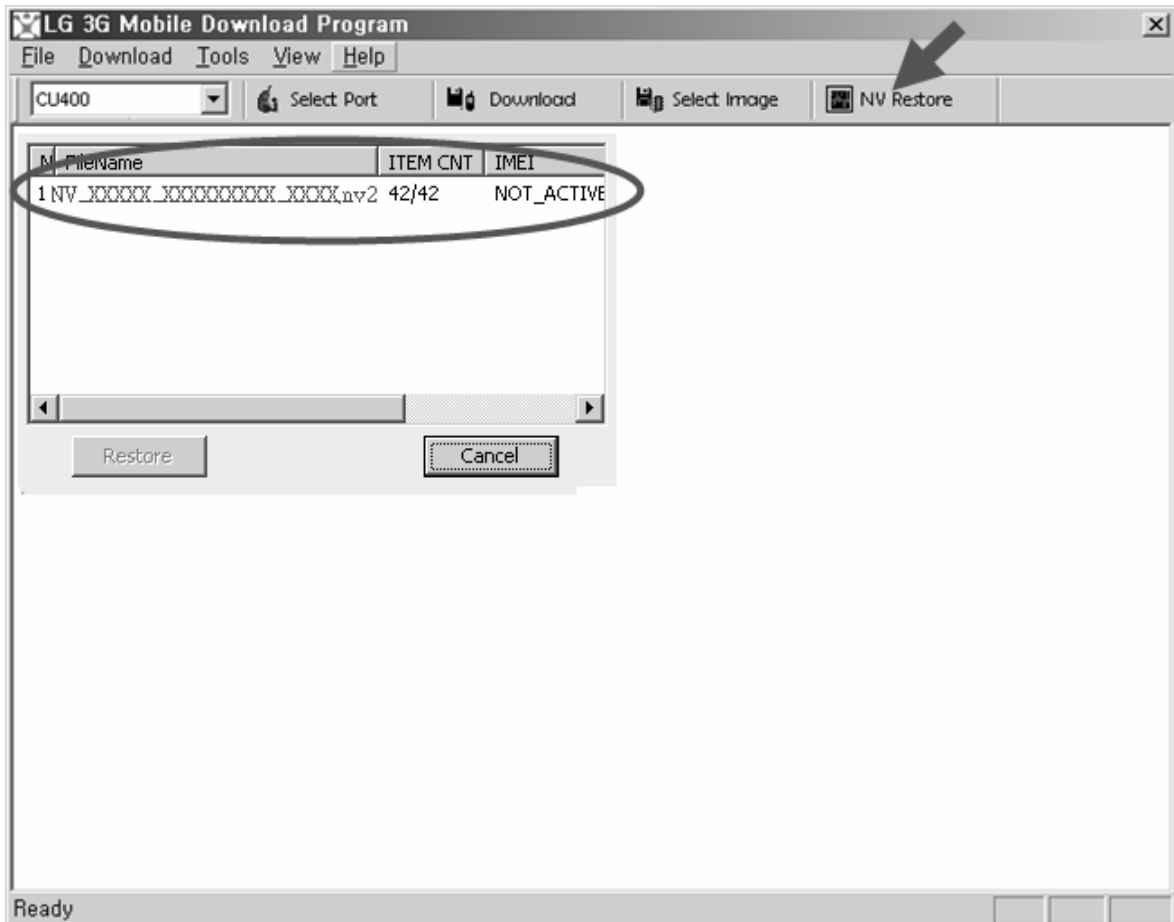
5. DOWNLOAD

→ Select the proper file and click on 'Restore'.

- 138 -
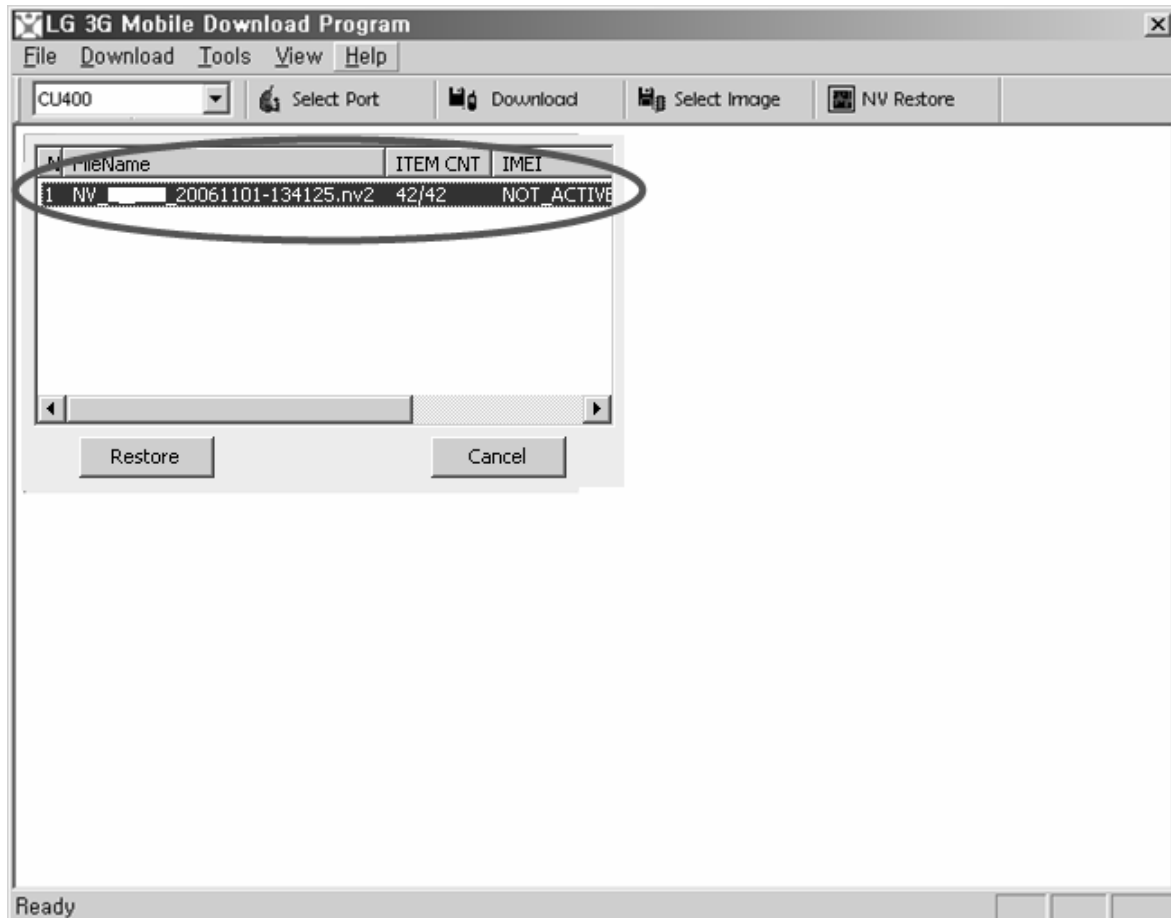
→ If you want image download and NV backup file restore at once, use the NV Default function.

Image Folder		D:₩image₩XXXXX	Browse...
Partition Table	☑	D:₩image₩XXXXX₩partition.mbn	Browse...
QCSBL Header	☑	D:₩image₩XXXXX₩qcsblhd_cfgdata.mbn	Browse...
QCSBL	☑	D:₩image₩XXXXX₩qcsbl.mbn	Browse...
OEMSBL Header	☑	D:₩image₩XXXXX₩oemsblhd.mbn	Browse...
OEMSBL	☑	D:₩image₩XXXXX₩oemsbl.mbn	Browse...
AMSS Modem Image Header	☑	D:₩image₩XXXXX₩amsshd.mbn	Browse...
AMSS Modem Image	☑	D:₩image₩XXXXX₩amss.mbn	Browse...
Media Image	☑	D:₩image₩XXXXX₩XXXXX-MEDIA-XXXX-XXX-XX-2007-XXX-XX.bin	Browse...
Module Image	☑	D:₩image₩XXXXX₩XXXXX-MODULE-XXX-XXX-XX-2007-XXX-XX.bin	Browse
NV Default	☐		Browse...
Flexible Logo	☑	D:₩image₩XXXXX₩booting_logo.flb	Browse...
☑ NV Backup/Restore	Reset Database & Contents ▼		Clear

Additional Options

☐ Dislpay Information

Start	DZ

5. DOWNLOAD

5.4 Caution

1) Multi-downloading using the USB hub is not recommendable.

2) If you see the message 'cal mode' after 'completing download', you must do NV restore and image (media and module) download.

3) In emergency mode, you can not download the media and module image. So if you want download media and module image, connect the phone normal mode after emergency mode download, and then you can do it.

4) The NV data saved at LGMDP folder like this.

D:\LGMDP\004400-01-429926_COM17

LGMDP folder name

IMEI number

Port number
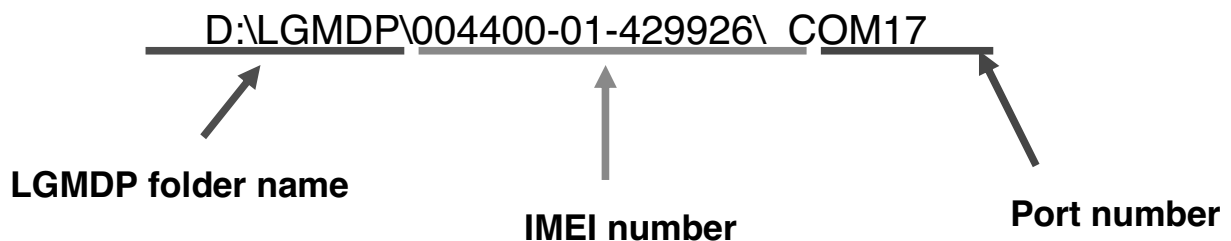
5) Recommended that the Module and Media Image have to be downloaded at the same time.

6) Erase EFS option will erase everything (media, module, nv items, and user data) in the EFS area..

6. BLOCK DIAGRAM

6.1 GSM & UMTS RF Block
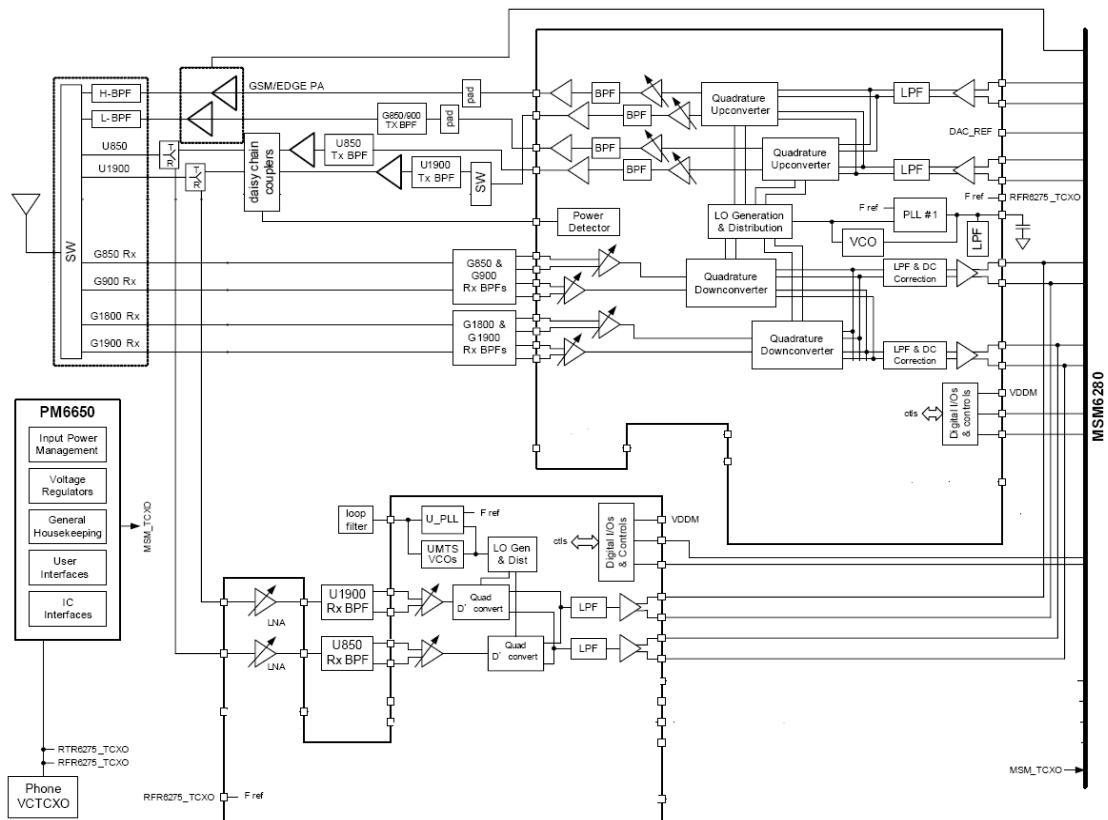
Fig 2.1-1.UMTS-850,1900+GSM-850/GSM-900/DCS-1800/PCS-1900 RF Functional Block Diagram

6.2 Interface Diagram
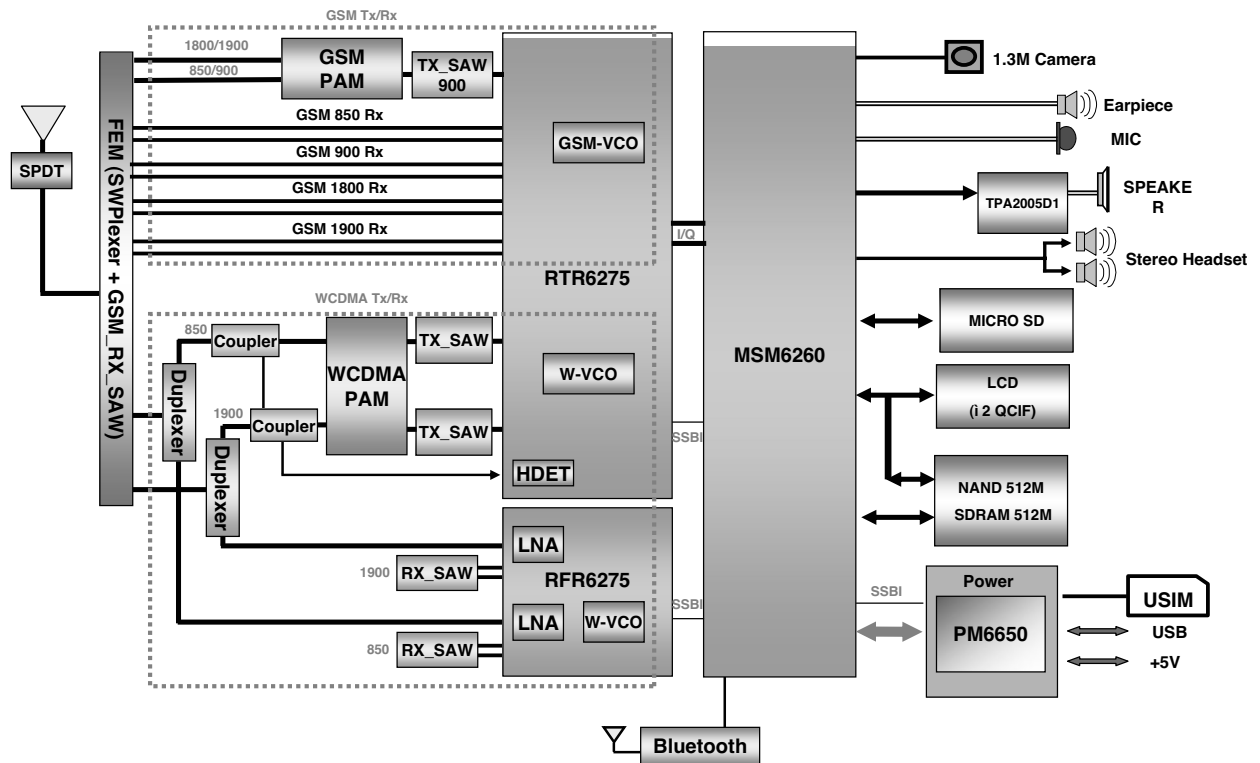
CU515 Interface Diagram

6. BLOCK DIAGRAM

Main RF signal

GSM850 TX : GSM850 Tx RF signal

GSM850 RX : GSM850 Rx RF signal

GSM900 TX : GSM900 Tx RF signal

GSM900 RX : GSM900 Rx RF signal

DCS TX : DCS Tx RF signal

DCS RX : DCS Rx RF signal

PCS TX : PCS Tx RF signal

PCS RX : PCS Rx RF signal

UMTS 850 TX : UMTS 850 Tx RF signal

UMTS 850 RX : UMTS 850 Rx RF signal

UMTS 1900 TX : UMTS 1900 Tx RF signal

UMTS 1900 RX : UMTS 1900 Rx RF signal

TX_I/Q : I/Q for Tx of RF

RX_I/Q : I/Q for Rx of RF

Control signal

ANT_SEL 0,1,2,3 : Ant Switch Module Mode Selection

    (UMTS, GSM850/GSM900 Tx/Rx, DCS Tx/Rx, PCS Tx/Rx)

GSM PA_CTL signal

    GSM_PA_BAND : DCS or PCS /GSM Mode Selection

    GSM_PA_EN : Power Amp Gain Control Enable

    GSM_PA_RAMP : Power Amp Gain Control

UMTS PA_CTL signal

    PA_ON1,2 : UMTS Tx Power Amp Enable

7. CIRCUIT DIAGRAM

7. CIRCUIT DIAGRAM

7. CIRCUIT DIAGRAM

7. CIRCUIT DIAGRAM

PMIC VPWR BYPASS

VDD_MSMC : 4.7uF   VDD_MSM : 0.1uF
VDD_MSME : 4.7uF   VDD_ANA : 0.1uF
VDD_PA : 4.7uF   VDD_RUM : 0.1uF
                    VDD_RF : 0.1uF
                    VDD_WLAN : 0.1uF
                    VDD_MAIN : 0.1uF
                    VDD_SPKR : 0.1uF

LCD_BACK_LIGHT_CHARGE_PUMP

U400
AAT3157ITP-T1

+VPWR
WLED_PWR
LCD_BL_CTRL

U401
PM6650-3P

Battery Charging Circuit

U402
NUS3116MTR2G

Differential lines, route as equal length as possible !! --> ICHARGE , ICHARGEOUT

Switcher Circuit for RF

Power Line --> Route carefully!!!!!
Draw the Artwork_line thickly !!!!!
---> USB_VBUS , FLASH_DRV_N , KPD_DRV_N , KEY_ON_SW_N , MOT_PWR-

Section	Date	Sign & Name	MODEL	CU515	Sheet/Sheets
Designer					4/6
Checked			DRAWING NAME	PMIC	
Approved					
LG Electronics Inc.			DRAWING NO.		

LGIC(42)-A-5505-10:01

LGMIC

7. CIRCUIT DIAGRAM

LGE Internal Use Only

7. CIRCUIT DIAGRAM

ON_SW

FOLDER_DETECT

SPK_EN

VOL

KEY

KEY_BACK_LIGHT LED(16EA)

Section	Date	Sign & Name	MODEL	CU515	Sheet/Sheets
Designer					6/6
Checked			DRAWING NAME	KEY	
Approved					
LG Electronics Inc.			DRAWING NO.		

LGIC(42)-A-5505-10:01

7. CIRCUIT DIAGRAM

FPCB_TO_LCD CONNECTOR

CN102

FPCB_TO_MAIN CONNECTOR

GB042-60S-H10-E3000
CN101

RCV+	LCD_CS_N
RCV-	LCD_ADS
	EBI2_WE_N
	SUB_LCD_CS_N
LCD_MAKER_ID	
LCD_RESET_N	
EBI2_DATA(0)	EBI2_DATA(8)
EBI2_DATA(1)	EBI2_DATA(9)
EBI2_DATA(2)	EBI2_DATA(10)
EBI2_DATA(3)	EBI2_DATA(11)
EBI2_DATA(4)	EBI2_DATA(12)
EBI2_DATA(5)	EBI2_DATA(13)
EBI2_DATA(6)	EBI2_DATA(14)
EBI2_DATA(7)	EBI2_DATA(15)
WLED_PWR	VGA_CAM_RESET
	WLED_1
LCD_IF_MODE	WLED_2
CAM_MCLK	WLED_3
	VGA_CAM_PWDN
CAM_DATA(0)	CAM_DATA(4)
CAM_DATA(1)	CAM_DATA(5)
CAM_DATA(2)	CAM_DATA(6)
CAM_DATA(3)	CAM_DATA(7)
CAM_PWDN	CAM_HSYNC
VREG_MSMP_2.7V	CAM_VSYNC
VREG_CAM_AVDD	CAM_PCLK
VREG_CAM_1.5V	CAM_RESET
MOTOR_PWR-	I2C_SCL
+VPWR	I2C_SDA

SBCL0001701
NBL414R-F9J

BAT100

Add the VGA Camera signal at Rev F

FPCB_TO_LCD CONNECTOR

CN102

EBI2_OE_N	VSYNCOUT
LCD_MAKER_ID	EBI2_WE_N
LCD_IF_MODE	LCD_CS_N
LCD_ADS	LCD_RESET_N
VREG_MSMP_2.7V	SUB_LCD_CS_N
	EBI2_DATA(0)
EBI2_DATA(15)	EBI2_DATA(1)
EBI2_DATA(14)	EBI2_DATA(2)
EBI2_DATA(13)	EBI2_DATA(3)
EBI2_DATA(12)	EBI2_DATA(4)
EBI2_DATA(11)	EBI2_DATA(5)
EBI2_DATA(10)	EBI2_DATA(6)
EBI2_DATA(9)	EBI2_DATA(7)
EBI2_DATA(8)	WLED_PWR
RCV-	WLED_1
RCV+	WLED_2
	WLED_3
SPK-	
SPK+	MOTOR_PWR-
	+VPWR

AXK8L40125G

MOT

MOT+

MOTOR_PWR-
+VPWR
MOTOR_PWR+

CN103

CAM_DATA(7)	I2C_SCL
CAM_DATA(6)	I2C_SDA
CAM_DATA(5)	
CAM_DATA(4)	CAM_VSYNC
CAM_DATA(3)	CAM_HSYNC
CAM_DATA(2)	CAM_MCLK
CAM_DATA(1)	
CAM_DATA(0)	VREG_CAM_AVDD
CAM_PCLK	VREG_MSMP_2.7V
CAM_RESET	VREG_CAM_1.5V
CAM_PWDN	

AXT324164

FPCB_TO_CAMERA CONNECTOR

TP3 TP4 TP5 TP6

VISION MARK

LGE Internal Use Only

LGIC(42)-A-5505-10:01

LG Electronics Inc.

8. BGM Pin Map

PIN ASSIGNMENT (TOP VIEW)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	●	●	●	●							●	●	●	●
B	●	●	●	●							●	●	●	●
C	●	●	A0	BA0	●	Vss	Vccd	CLK	A12	A9	A7	A5	●	●
D	●	Vccd	A1	BA1	$\overline{RAS}$	$\overline{WEd}$	●	CKE	A11	A8	A6	A-4	Vccd	●
E	●	A3	A2	A10	$\overline{CS}$	$\overline{CAS}$	●	●	●	●	●	●		
F		●	●	●	●	●	Vss	●	●	●	●	●	●	
G		Vss	●	●	●	●	●	●	●	●	I/O16	I/O8	Vss	
H			●	●	●	●	●		I/O15	I/O7	I/O14	I/O6	I/O13	
J			●	●	●	●	●		I/O5		●	●		
K	●		●	●	●	$\overline{WEn}$			I/O12		●	●	Vccn	●
L	●		●	●	●	$\overline{WP}$			I/O10	I/O3	I/O11	I/O4	Vss	●
M		RY/$\overline{BY}$	ALE	CLE	●	●			$\overline{CE}$	$\overline{RE}$	I/O1	I/O9	I/O2	
N		●			●	●			●	●	●	●	●	
P		Vss	DQ16	DQ18	DQ20	DQ22	●	●	DQ24	DQ25	DQ27	DQ29	Vss	
R		●	DQ17	DQ19	DQ21	DQ23	●	Vss	●	DQ26	DQ28	DQ30	DQ31	
T		●	DQ1	DQ2	DQ5		●	DQM1	DQ8	DQ9	DQ11	DQ14	●	
U	●	Vss	●	DQ0	DQ4	Vss	DQ7	DQM0	DQM3	Vss	DQ12	DQ15	Vss	●
V	●	●	Vccd	Vccqd	DQ3	DQ6	DQM2	Vccd	Vccqd	DQ10	DQ13	Vccd	●	●
W	●	●	●	●							●	●	●	●
Y	●	●	●	●							●	●	●	●

U301

Memory : TY900A800KOGG40

(EUSY0336902)

● Do Not Use

U200
Modem MSM6260
EUSY0334501

Do Not Use

9. PCB LAYOUT

U600-Hall IC
A3212EELLT-T
Cannot detect folder open/close

CU515-MAIN-SPFY0151201-1.0-TOP

9. PCB LAYOUT

CN500-LCD connector
GB042-60P-H10-E3000
No LCD display
No receiver sound
No camera preview
No vibration

U400-Charge pump for LCD backlight
AAT3157ITP-T1
No LCD backlight

U402-Charging TR. & FET
NUS3116MTR2G
Cannot charge the battery

U501-Overvoltage protection IC
NUS3065MUTAG
Cannot protect overvoltage

U401-Power management IC
PM6650-3P
Cannot boot the phone

MIC300-Microphone
SP0204LE5-PB
The person on the other end of the line
cannot hear anything

U106-WCDMA Receiver
RFR6275
WCDMA Rx performance

U106-WCDMA Receiver
RFR6275
WCDMA Rx performance

FL104-Duplex
ACMD-7402-TR1G
WCDMA1900 Duplex

SW100-Antenna Switch
Mobile Switch

U300-Speaker amp.
TPA2005D1ZQYR
No speaker sound

U301-Memory
TY9000A800JOGG
Cannot boot the phone

ANT104-Bluetooth antenna
AMAA903015LG12
No B/T connection

M100-Bluetooth module
LBRQ-2B43A
No B/T connection

U200-MODEM
MSM6260
Cannot boot the phone

U601-RF Transceiver
RTR6275
GSM Rx, Tx performance
& WCDMA Tx performance

U105-WCDMA PAM
AWT6321R
WCDMA Tx power

FL100-FEM
DGM099M01
Cannot connect the network

U101-GSM PAM
TQM7M5003
GSM Tx power

CU515-MAIN-SPFY0151201-1.0-BOT

9. PCB LAYOUT

CN102-camera connector
AXK8L40125G
No LCD display
No receiver sound

CN103-camera connector
AXT324164
No camera preview

CN101-LCD connector
GB042-60S-H10-E3000
No LCD display
No receiver sound
No camera preview
No vibration

CN102

CN103

CN101

CU515-F-LCD-1.0-TOP

9. PCB LAYOUT

BAT100

MOT

MOT+

CU515-F-LCD-1.0-BOTTOM

10. Calibration & RF Auto Test Program (Hot Kimchi)

10.1 Configuration of HOT KIMCHI

10.1.1 Configuration of directory

Jhangee	**Common**	**At_Serial_Cmd.xml**
	Debug → **Auto**	**Diag_NV6250_RevB.dll**
	Cal	**Diag_NV6275.dll**
	CalAuto	**Diag_NV6280.dll**
	Hot_Kimchi → **ComLMPLib_2_11.dll**	**Diag_NV.dll**
	Dll_EzLooksMQ_015.dll	**DLL_E5515CD.dll**
	GuiTk115d.dll	**DLL_PwrControlD.dll**
	HK_32.exe	**DLL_SerialATD.dll**
	ShieldBox_DllD.dll	**LG_CL_015.dll**
		PwrSupply_Cmd.xml
	Model → **CU515**	**AutoSetup_100.xml**
	LG_RfTest_E5515C_107.dll	**Cal_Setup_Test.xml**
	LG_NsTest_E5515C_239.dll	**Ezlooks.xml**
	QMSL_MSVC6R.dll	**LG_RfCal_Q3G6280N_Polar_003.dll**
	UI → **LG_UI_Qu6275_004.dll**	**NstProcedure_CU515_101.xml**
		script_100.xml
	Multi HK.reg	**Spec_CU515_110.xml**

■ : Directory

□ : File

10.1.2 Description of basic files

1. Cal_Setup_Test.xml : Parameter Setup File for Calibration items

2. NstProcdure_CU515_101.xml : Scenario Setup File for Auto RF-Test

3. Spec_CU515_110.xml : Specification File of RF Test items

4. LG_RfCal_Q3G6280N_Polar_003.dll : RF Calibration DLL File including RF Calibration sequence functions

5. LG_NsTest_E5515C_239.dll : Auto RF-Test DLL File including RF Test sequence functions

6. DLL_E5515CD.DLL : GPIB DLL File including measuring functions in E5515CD Test Set

10.2 How to use HOT KIMCHI
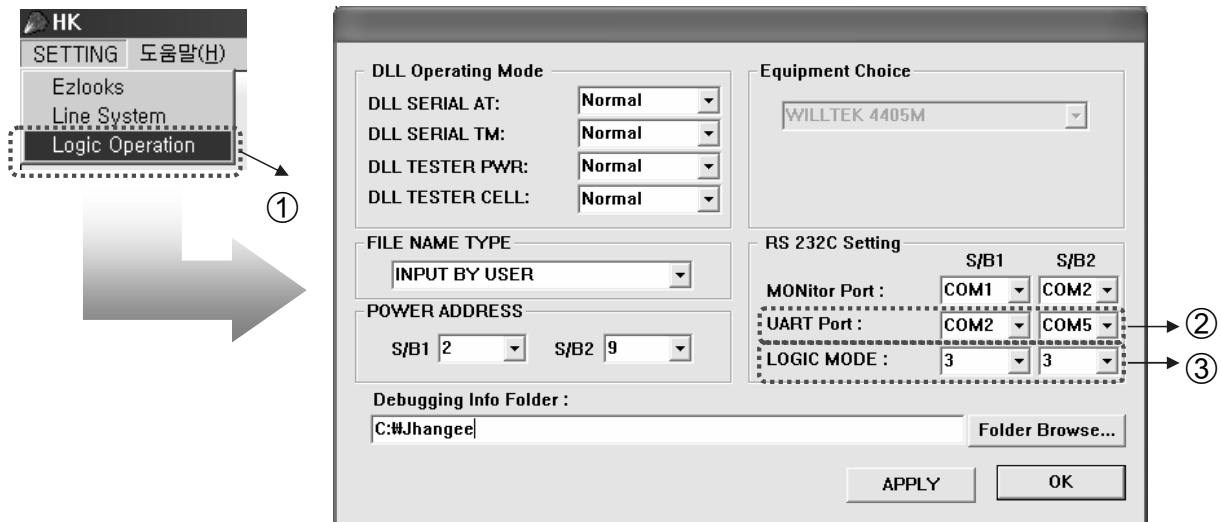
* **Procedure**

1. Click "Logic Operation" of "SETTING" menu bar

2. Select "UART Port" that PC can communicate with the phone

3. Select "LOGIC MODE" that you want

- Logic Mode -> 1: Calibration Only

                 2: Auto Test Only

                 3: Calibration + Auto

* **Procedure**

4. Select the model name "CU515"

5. Click "Start" button

11. EXPLODED VIEW & REPLACEMENT PART LIST

11.1 EXPLODED VIEW

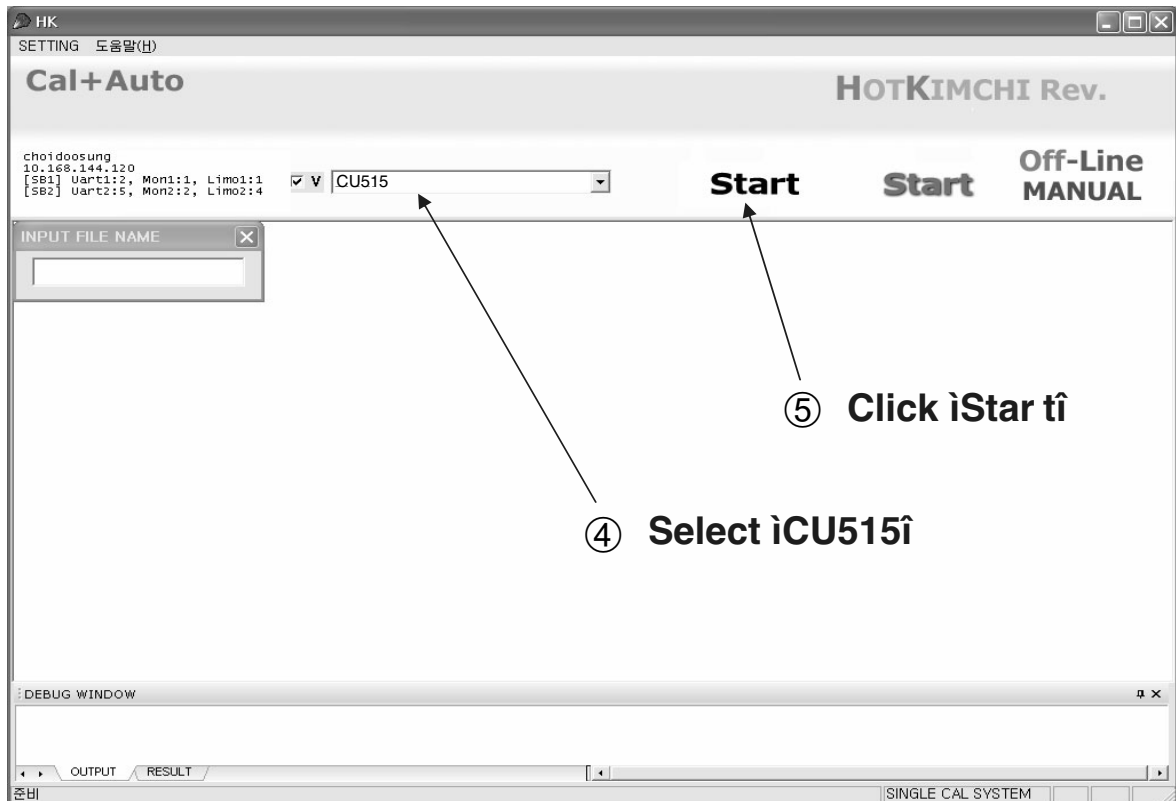| NO.	DESCRIPTION	Q'TY	DRAWING NO.
85	BATTERY PACK,LI-ION	1	SBPL0086901
84	PAD_SD	1	MPBZ0193901
83	SPONGE_SD	1	MGAD0153901
82	TAPE,CONTACT,LOWER	1	MTAC0061301
81	FINGER,1P(1.2T)	1	MFCA0000501
80	GASKET,HINGE	1	MGAD0153701
79	INSULATOR,MOTOR	1	MIDZ0149901
78	GOLD,TAPE,2	1	MGAZ0058801
77	PAD,LCD	2	MPBG0069601
76	SHEET,EARJACK	1	MSAB0001102
75	FINGER,4P	1	MFCA0008201
74	FINGER,2P	3	MFCA0000502
73	GOLD,TAPE,1	1	MGAD0150101
72	CAP,SCREW REAR	1	MCCH0107001
71	COVER,BATTERY	1	MCJA0044101
70	CAP,SD	1	MCCG0008401
69	SHEET,SD	1	MSAB0017601
68	SHEET,RF	1	MSAB0018701
67	CAP,EARPHONE JACK	1	MCCC0045301
66	LOCKER,SIM	1	MLEY0000801
65	SPONGE,FRONT,CONTACT	1	MGAD0150401
64	INSULATOR,BUTTON SPEAKER	1	MIDZ0135301
63	COVER,REAR	1	MCJN0068201
62	INTENNA	1	SNGF0027001
61	LABEL,WATER	1	MLAB0001102
60	BATTERY CONN (3P)	1	ENZY0015701
59	PAD,BRACKET SPEAKER,REAR	1	MPBN0043401
58	PAD,SPEAKER,B2B	1	MPBZ0188001
57	BUTTON,SPEAKER	1	MBJL0041501
56	FILTER,SPEAKER	1	MFBC0031601
55	SCREW,MACHINE(M1.4*3.5)	6	GMEY0009201
54	SCREW,MACHINE(M1.4*3.0)	4	GMEY0011201
53	PROTECTION,WINDOW,SUB	1	MTAB0173701
52	TAPE,FPCB,SPEAKER	1	MTAJ0000801
51	SPEAKER	1	SUSY0021602
50	PAD,SPEAKER	1	MPBN0042501
49	GASKET,FRONT,DOME	2	MGAD0150201
48	BRACKET,SPEAKER	1	MBFK0003401
47	PCB,MAIN	1	SAFY0200901
46	DOME ASSY METAL	1	ADCA0066901
45	KEYPAD MAIN	1	MKAG0000601
44	INSERT	4	MICZ0021501
43	INSERT	2	MICE0002001
42	STOPPER,FOLDER(BUMPER)	2	MSGG0000701
41	COVER,FRONT	1	MCJK0072201
40	FILTER,MIC	1	MFBD0023601
39	INSULATION,IC	1	MIDZ0135401
38	HINGE,FOLDER	1	MHFD0015301
37	HINGE,CONTACT,FRONT	1	MTCB0011101
36	STOPPER,HINGE	1	MSGB0019701
35	BUSING HINGE	1	MBIB0005701
34	BUTTON,VOLUME	1	MBJL0041601
33	SHEET,UPPER	1	MSAB0018601
32	CAP,SCREW LOWER BTM	2	MCCH0106801
31	WINDOW,LCD	1	MWAC0080101
30	CAP,SCREW LOWER TOP	1	MCCH0106601
29	DECO,RECEIVER	1	MDAH0022001
28	TAPE,DECO RECEIVER	1	MTAA0136801
27	FILTER,RECEIVER	1	MFBB0022501
26	PAD,RECEIVER LOWER	1	MPBM0018801
25	COVER,LOWER	1	MCJH0039201
24	MAGNET, SWITCH	1	MMAA0000601
22	HINGE CONTACT LOWER	1	MTCB0011201
21	LCD BRACKET	1	MBFF0013901
20	TAPE,MOTOR	1	MTAF0012801
19	TAPE,CAMERA	1	MTAK0001401
18	LCD,MODULE	1	SVLM0025601
17	RECEIVER	1	SURY0013501
16	VIBRATOR,MOTOR	1	SJMY0002601
15	CAMERA,MODULE	1	SVCY0015001
14	MAIN FPCB	1	SACY0061101
13	INSERT UPPER	4	MICC0010301
12	TAPE,LCD SUB	1	MTAE0031601
11	PROTECTION,UPPER	1	MTAB0176101
10	GASKET,CONNECTOR(B2B)	1	MGAZ0058701
9	INSULATOR,LCD,1	1	MIDZ0142601
8	PAD,RECEIVER	1	MPBM0018201
7	PAD,LCD SUB	1	MPBQ0032301
6	GASKET,BTOB	1	MGAD0151601
5	PAD,MOTOR(UPPER)	1	MPBJ0044601
4	PAD,CAMERA	1	MPBT0041901
3	PAD,CONNECTOR CAMERA	1	MPBU0002401
2	COVER,UPPER	1	MCJJ0048601
1	WINDOW,LCD SUB	1	AVAB0027301
NO.	DESCRIPTION	Q'TY	DRAWING NO.

ASS'Y EXPLODED VIEW
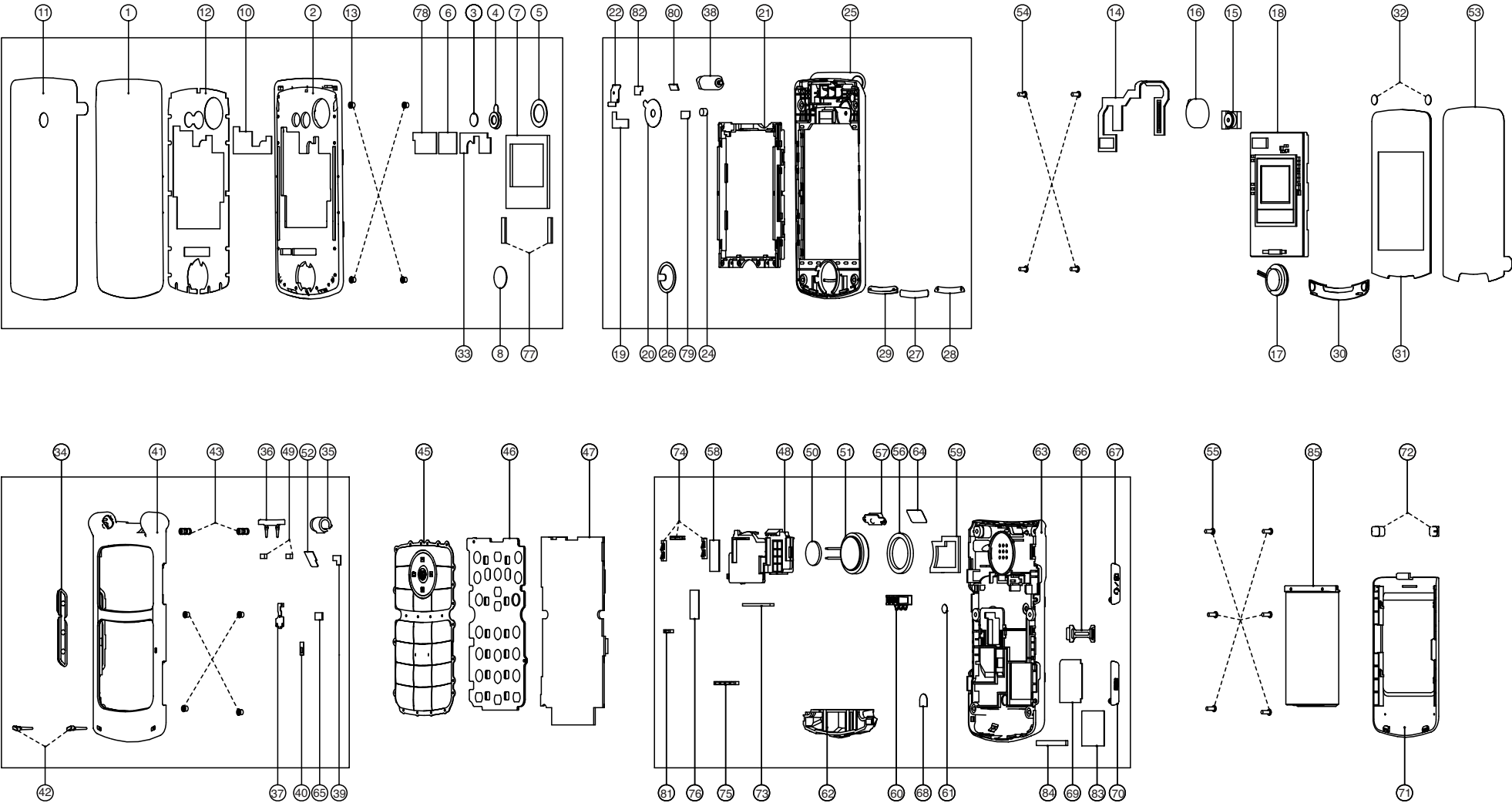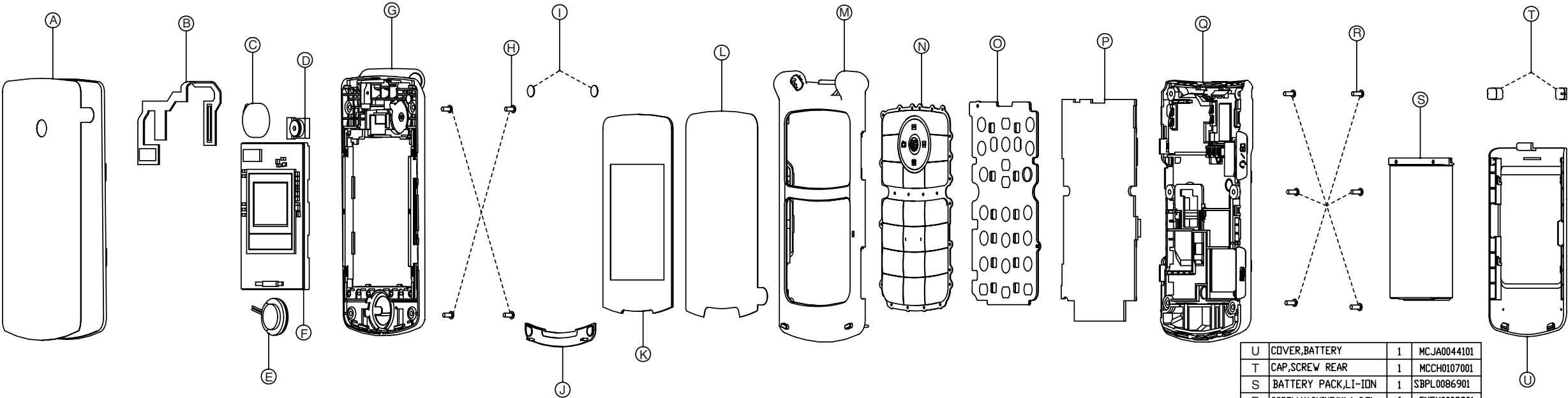
NO.	DESCRIPTION	Q'TY	DRAWING NO.
U	COVER,BATTERY	1	MCJA0044101
T	CAP,SCREW REAR	1	MCCH0107001
S	BATTERY PACK,LI-ION	1	SBPL0086901
R	SCREW,MACHINE(M1.4*3.5)	6	GMEY0009201
Q	COVER REAR, ASSY	1	ACGM0090901
P	PCB,MAIN	1	SAFY0200901
O	DOME ASSY METAL	1	ADCA0066901
N	KEYPAD MAIN	1	MKAG0000601
M	COVER FRONT, ASSY	1	ACGK0089801
L	PROTECTION,WINDOW,SUB	1	MTAB0173701
K	WINDOW,LCD	1	MWAC0080101
J	CAP,SCREW LOWER TOP	1	MCCH0106601
I	CAP,SCREW LOWER BTM	2	MCCH0106801
H	SCREW,MACHINE(M1.4*3.0)	4	GMEY0011201
G	COVER LOWER, ASSY	1	ACGH0049201
F	LCD,MODULE	1	SVLM0025601
E	RECEIVER	1	SURY0013501
D	CAMERA,MODULE	1	SVCY0015001
C	VIBRATOR,MOTOR	1	SJMY0002601
B	MAIN FPCB	1	SACY0061101
A	COVER UPPER, ASSY	1	ACGJ0064201

11.2 Replacement Parts <Mechanic component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Spec	Color	Remark
1		IMT,FOLDER	TIFF0015001		Gray	
2	AAAY00	ADDITION	AAAY0205201	CU515 ATTBK	Dark Silver	
3	MCJA00	COVER,BATTERY	MCJA0044101	MOLD, PC LUPOY SC-1004A, , , , ,	Black	71,U
2	APEY00	PHONE	APEY0404201	CU420 ATTGR	Dark Silver	
3	ACGG00	COVER ASSY,FOLDER	ACGG0083101		Black	
4	ACGH00	COVER ASSY, FOLDER(LOWER)	ACGH0049201		Black	G
5	MBFF00	BRACKET,LCD	MBFF0013901	PRESS, STS, , , , ,	Black	21
5	MCJH00	COVER,FOLDER(LOWER)	MCJH0039201	MOLD, PC LUPOY SC-1004A, , , , ,	Black	25
5	MDAH00	DECO,RECEIVER	MDAH0022001	PRESS, AI, , , , ,	Silver	29
5	MFBB00	FILTER,RECEIVER	MFBB0022501	COMPLEX, (empty), , , , ,	Black	27
5	MGAD00	GASKET,SHIELD FORM	MGAD0153701	CUTTING, EPDM, , , , ,	Gold Gray	80
5	MHFD00	HINGE,FOLDER	MHFD0015301	COMPLEX, (empty), , , , ,	Gray	38
5	MIDZ00	INSULATOR	MIDZ0149901	CUTTING, EPDM, , , , ,	Blue	79
5	MMAA00	MAGNET,SWITCH	MMAA0001601	7100 magnetic	Silver	24
5	MPBM00	PAD,RECEIVER	MPBM0018801	CUTTING, EPDM, , , , ,	Black	26
5	MTAA00	TAPE,DECO	MTAA0136801	COMPLEX, (empty), , , , ,	Transparent	28
5	MTAC00	TAPE,SHIELD	MTAC0061301	CUTTING, EPDM, , , , ,	Without Color	82
5	MTAF00	TAPE,MOTOR	MTAF0012801	CUTTING, EPDM, , , , ,	Transparent	20
5	MTAK00	TAPE,CAMERA	MTAK0001401	COMPLEX, (empty), , , , ,	Black	19
5	MTCB00	TERMINAL,PIN	MTCB0011201	PRESS, PB, , , , ,	Black	22
4	ACGJ00	COVER ASSY, FOLDER(UPPER)	ACGJ0064201		Black	A
5	AWAB00	WINDOW ASSY,LCD	AWAB0027301	WINDOW ASSY LCD (SUB)	Black	1
6	BFAA00	FILM,INMOLD	BFAA0068901	; ,BLACK ,0.01 ,600 ,500	Transparent	
6	MWAF00	WINDOW,LCD(SUB)	MWAF0037901	MOLD, PMMA HI835M, , , , ,	Transparent	
5	MCJJ00	COVER,FOLDER(UPPER)	MCJJ0048601	MOLD, PC LUPOY SC-1004A, , , , ,	Black	2
6	MICC00	INSERT,FRONT(UPPER)	MICC0010301		Without Color	13
5	MGAD00	GASKET,SHIELD FORM	MGAD0151601	CUTTING, EPDM, , , , ,	Gold	6

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
5	MGAZ00	GASKET	MGAZ0058701	CUTTING, EPDM, , , , ,	Gold	10
5	MGAZ01	GASKET	MGAZ0058801	CUTTING, EPDM, , , , ,	Gold	78
5	MPBG00	PAD,LCD	MPBG0069601	CUTTING, EPDM, , , , ,	Black	77
5	MPBJ00	PAD,MOTOR	MPBJ0044601	CUTTING, EPDM, , , , ,	Black	5
5	MPBM00	PAD,RECEIVER	MPBM0018201	CUTTING, EPDM, , , , ,	Black	8
5	MPBQ00	PAD,LCD(SUB)	MPBQ0032301	CUTTING, EPDM, , , , ,	Black	7
5	MPBT00	PAD,CAMERA	MPBT0041901	CUTTING, EPDM, , , , ,	Black	4
6	MTAB00	TAPE,PROTECTION	MTAB0174101	COMPLEX, (empty), , , , ,	Transparent	
5	MPBU00	PAD,CONNECTOR	MPBU0002401	CUTTING, EPDM, , , , ,	Black	3
5	MSAB00	SHEET,OPERATING	MSAB0018601	CUTTING, EPDM, , , , ,	Black	33
5	MTAB01	TAPE,PROTECTION	MTAB0176101	COMPLEX, (empty), , , , ,	Black	11
5	MTAE00	TAPE,WINDOW(SUB)	MTAE0031601	COMPLEX, (empty), , , , ,	Transparent	12
4	ACGK00	COVER ASSY,FRONT	ACGK0089801		Black	M
5	MBIB00	BUSHING,HINGE	MBIB0005701	CASTING, Mg Alloy, , , , ,	Black	35
5	MBJL00	BUTTON,SIDE	MBJL0041601	MOLD, PC LUPOY SC-1004A, , , , ,	Black	34
5	MCJK00	COVER,FRONT	MCJK0072201	MOLD, PC LUPOY SC-1004A, , , , ,	Black	41
6	MICE00	INSERT,NUT	MICE0002001	CUTTING, BeCu, , , , ,	Gold	43
6	MICZ	INSERT	MICZ0021501	M1.4 * 2.0	Black	44
5	MFBD00	FILTER,MIKE	MFBD0023601	COMPLEX, (empty), , , , ,	Black	40
5	MGAD00	GASKET,SHIELD FORM	MGAD0150201	CUTTING, EPDM, , , , ,	Gold	49
5	MGAD01	GASKET,SHIELD FORM	MGAD0150401	CUTTING, EPDM, , , , ,	Gold Gray	65
5	MIDZ00	INSULATOR	MIDZ0135401	COMPLEX, (empty), , , , ,	Transparent	39
5	MSGB00	STOPPER,HINGE	MSGB0019701	MOLD, Silicone Rubber KE941-U, , , , ,	Black	36
5	MSGC01	STOPPER,FOLDER	MSGC0000701	MOLD, Urethane Rubber S190A, , , , ,	Black	42
5	MTAJ00	TAPE,FLEXIBLE PCB	MTAJ0000801	COMPLEX, (empty), , , , ,	Black	52
5	MTCB00	TERMINAL,PIN	MTCB0011101	PRESS, PB, , , , ,	Black	37
4	GMEY00	SCREW MACHINE,BIND	GMEY0011201	1.4 mm,3 mm,MSWR3(BK) ,N ,+ ,NYLOK	Without Color	54,H
4	MCCH00	CAP,SCREW	MCCH0106601	MOLD, Silicone Rubber KE941-U, , , , ,	Black	30,J
5	MTAZ00	TAPE	MTAZ0194801	CUTTING, EPDM, , , , ,	Without Color	
4	MCCH01	CAP,SCREW	MCCH0106801	MOLD, Silicone Rubber KE941-U, , , , ,	Black	32,I
4	MGAD00	GASKET,SHIELD FORM	MGAD0156401	COMPLEX, (empty), , , , ,	Gold	

Level	Location No.	Description	Part Number	Spec	Color	Remark
4	MIDZ00	INSULATOR	MIDZ0142601	CUTTING, EPDM, , , , ,	Blue	9
4	MKAG00	KEYPAD,MAIN	MKAG0000601	MOLD, PC LUPOY SC-1004A, , , , ,	Black	45,N
4	MLAC	LABEL,BARCODE	MLAC0003401	EZ LOOKS(user for mechanical)	Without Color	
4	MTAB00	TAPE,PROTECTION	MTAB0173701	CUTTING, EPDM, , , , ,	Transparent	53,L
4	MWAC00	WINDOW,LCD	MWAC0080101	CUTTING, PMMA HI835M, , , , ,	Transparent	31,K
5	MPBG00	PAD,LCD	MPBG0062101	CUTTING, EPDM, , , , ,	Black	
5	MTAD00	TAPE,WINDOW	MTAD0069301	COMPLEX, (empty), , , , ,	Transparent	
3	ACGM00	COVER ASSY,REAR	ACGM0090901		Black	Q
4	MBFK00	BRACKET,SPEAKER	MBFK0003401	MOLD, PC LUPOY SC-1004A, , , , ,	Black	48
4	MBJL00	BUTTON,SIDE	MBJL0041501	MOLD, PC LUPOY SC-1004A, , , , ,	Black	57
4	MCCC00	CAP,EARPHONE JACK	MCCC0045301	MOLD, PC LUPOY SC-1004A, , , , ,	Black	67
4	MCCG00	CAP,MULTIMEDIA CARD	MCCG0008401	MOLD, PC LUPOY SC-1004A, , , , ,	Black	70
4	MCJN00	COVER,REAR	MCJN0068201	MOLD, PC LUPOY SC-1004A, , , , ,	Black	63
4	MFBC00	FILTER,SPEAKER	MFBC0031601	COMPLEX, (empty), , , , ,	Black	56
4	MFCA00	FINGER,GROUND	MFCA0000502	PRESS, BeCu, , , , ,	Without Color	74
4	MFCA01	FINGER,GROUND	MFCA0008201	PRESS, BeCu, , , , ,	Gold	75
4	MFCA02	FINGER,GROUND	MFCA0000501	t=0.1, 1p		81
4	MGAD00	GASKET,SHIELD FORM	MGAD0153901	COMPLEX, (empty), , , , ,	Brown	83
4	MGAD01	GASKET,SHIELD FORM	MGAD0150101	CUTTING, EPDM, , , , ,	Gold	73
4	MIDZ00	INSULATOR	MIDZ0135301	COMPLEX, (empty), , , , ,	Transparent	64
4	MLAB00	LABEL,A/S	MLAB0001102	C2000 USASV DIA 4.0	White	61
4	MLEY00	LOCKER	MLEY0000801	SIM LOCKER	Silver	66
4	MPBN00	PAD,SPEAKER	MPBN0042501	CUTTING, EPDM, , , , ,	Black	50
4	MPBN02	PAD,SPEAKER	MPBN0043401	COMPLEX, (empty), , , , ,	Black	59
4	MPBZ00	PAD	MPBZ0188001	CUTTING, EPDM, , , , ,	Black	58
4	MPBZ01	PAD	MPBZ0193901	CUTTING, EPDM, , , , ,	Black	84
4	MSAB00	SHEET,OPERATING	MSAB0017601	CUTTING, EPDM, , , , ,	Black	69
4	MSAB01	SHEET,OPERATING	MSAB0018701	CUTTING, EPDM, , , , ,	Black	68
4	MSAB02	SHEET,OPERATING	MSAB0019201	CUTTING, EPDM, , , , ,	Black	
3	GMEY00	SCREW MACHINE,BIND	GMEY0009201	1.4 mm,3.5 mm,MSWR3(BK) ,B ,+ ,HEAD D=2.7mm	Black	55,R
3	MCCH00	CAP,SCREW	MCCH0107001	MOLD, Silicone Rubber KE941-U, , , , ,	Black	72,T

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
3	MLAK00	LABEL,MODEL	MLAK0006901			
5	ADCA00	DOME ASSY,METAL	ADCA0066901		White	46,O
5	MLAZ00	LABEL	MLAZ0038301	PID Label 4 Array	Without Color	

11.2 Replacement Parts <Main component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Spec	Color	Remark
4	SACY00	PCB ASSY,FLEXIBLE	SACY0061101			14,B
5	SACE00	PCB ASSY,FLEXIBLE,SMT	SACE0055501			
6	SACC00	PCB ASSY,FLEXIBLE,SMT BOTTOM	SACC0034701			
7	BAT100	BATTERY,CELL,LITHIUM	SBCL0001701	2 V,0.5 mAh,CYLINDER ,Reflow type BB, Max T 1.67, phi 4.8, Pb-Free		
6	SACD00	PCB ASSY,FLEXIBLE,SMT TOP	SACD0045301			
7	CN101	CONNECTOR,BOARD TO BOARD	ENBY0036801	60 PIN,0.4 mm,ETC , ,H=1.0, Socket		
7	CN102	CONNECTOR,BOARD TO BOARD	ENBY0020201	40 PIN,0.4 mm,ETC , ,H=0.9, Header		
7	CN103	CONNECTOR,BOARD TO BOARD	ENBY0034001	24 PIN,0.4 mm,ETC , ,P4S H=1.5, Socket		
6	SPCY00	PCB,FLEXIBLE	SPCY0103001	POLYI ,0.5 mm,MULTI-5 , ,; , , , , , , , , ,		
4	SJMY00	VIBRATOR,MOTOR	SJMY0002601	3.0 V,80 mA,12*3.4 ,		16,C
4	SURY00	RECEIVER	SURY0013501	ASSY ,105 dB,32 ohm,13*3.4 , ,; , , , , , , ,WIRE ,		17,E
4	SVCY00	CAMERA	SVCY0015001	CMOS ,MEGA ,1.3M SS-LSI (1/5"), 7x12x4.1t, HPCB		15,D
4	SVLM00	LCD MODULE	SVLM0025601	MAIN ,M_176*220 S_96 64 Mono ,38.5*51.8*3.2 ,262k ,TFT ,TM ,S6B0724 ,		18,F
4	ENZY00	CONNECTOR,ETC	ENZY0015701	3 PIN,3 mm,ETC , ,H=6.5		60
4	SNGF00	ANTENNA,GSM,FIXED	SNGF0027001	3.0 ,-2 dBd, ,GSM850+EGSM+DCS+PCS+W-BAND II+W-BAND V, INTERNAL ,; ,QUAD ,-2.0 ,50 ,3.0		62
4	SUSY00	SPEAKER	SUSY0021602	ASSY ,8 ohm,90 dB,17 mm,20mm elco8000 ,; , , , , , , ,CONNECTOR		51
3	SAFY00	PCB ASSY,MAIN	SAFY0200901	CU420 ATTGR	Dark Silver	47,P
4	SAFB00	PCB ASSY,MAIN,INSERT	SAFB0072201	CU420 ATTGR		
5	SPKY00	PCB,SIDEKEY	SPKY0047401	POLYI ,0.2 mm,DOUBLE ,CU420 SPK SIDEKEY ,; , , , , , , , , ,		
5	SPKY004	PCB,SIDEKEY	SPKY0047301	POLYI ,0.2 mm,DOUBLE ,CU420 VOLUME SIDEKEY ,; , , , , , , , , ,		
4	SAFF00	PCB ASSY,MAIN,SMT	SAFF0122101	CU420 ATTGR		
5	SAFC00	PCB ASSY,MAIN,SMT BOTTOM	SAFC0090801	CU420 ATTGR		
6	ANT104	ANTENNA,GSM,FIXED	SNGF0028501	3.0 ,-2.0 dBd, ,BLUETOOTH, SMD, 9.0*3.0*1.65 ,; ,SINGLE ,-2.0 ,50 ,3.0		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C1	CAP,CHIP,MAKER	ECZH0000841	56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C10	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C101	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C102	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C103	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C104	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C105	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C106	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C107	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C11	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C12	CAP,CHIP,MAKER	ECZH0000816	12 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C13	CAP,CERAMIC,CHIP	ECCH0001002	180 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C14	CAP,CHIP,MAKER	ECZH0001002	0.5 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C15	CAP,CERAMIC,CHIP	ECCH0000149	3.3 nF,50V,K,X7R,HD,1005,R/TP		
6	C16	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C17	CAP,CHIP,MAKER	ECZH0000816	12 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C18	CAP,CHIP,MAKER	ECZH0000841	56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C19	CAP,CHIP,MAKER	ECZH0001002	0.5 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C2	CAP,CERAMIC,CHIP	ECCH0001002	180 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C20	CAP,CERAMIC,CHIP	ECCH0000129	120 pF,50V,J,NP0,TC,1005,R/TP		
6	C200	CAP,TANTAL,CHIP,MAKER	ECTZ0004701	4.7 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C201	CAP,TANTAL,CHIP	ECTH0004807	10 uF,10V ,M ,STD ,1608 ,R/TP ,; , ,[empty] ,[empty] , ,-55TO+125C , ,[empty] ,[empty] ,[empty] ,[empty]		
6	C202	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C203	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C204	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C205	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C206	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C207	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C208	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C209	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C21	CAP,CERAMIC,CHIP	ECCH0000129	120 pF,50V,J,NP0,TC,1005,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C210	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C211	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C212	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C213	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C214	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C215	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C216	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C217	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C218	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C219	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C22	CAP,CERAMIC,CHIP	ECCH0000129	120 pF,50V,J,NP0,TC,1005,R/TP		
6	C220	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C221	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C222	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C223	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C224	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C225	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C226	CAP,CERAMIC,CHIP	ECCH0000147	2.2 nF,50V,K,X7R,HD,1005,R/TP		
6	C227	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C228	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C229	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C23	CAP,CHIP,MAKER	ECZH0001002	0.5 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C230	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C231	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C232	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C233	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C234	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C235	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C236	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C237	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C238	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C239	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C24	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C240	CAP,CERAMIC,CHIP	ECCH0000161	33 nF,16V,K,X7R,HD,1005,R/TP		
6	C241	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C25	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C26	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C27	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C28	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C29	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C3	CAP,CERAMIC,CHIP	ECCH0001002	180 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C30	CAP,TANTAL,CHIP	ECTH0001703	22 uF,6.3V ,M ,L_ESR ,2012 ,R/TP		
6	C300	CAP,TANTAL,CHIP	ECTH0004807	10 uF,10V ,M ,STD ,1608 ,R/TP ,; , ,[empty] [empty] , ,-55TO+125C , ,[empty] ,[empty] ,[empty] ,[empty]		
6	C301	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C302	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C303	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C304	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C305	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C306	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C307	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C308	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C309	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C31	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C310	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C311	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C312	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C313	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C314	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C315	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C316	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C317	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C318	CAP,TANTAL,CHIP	ECTH0004807	10 uF,10V ,M ,STD ,1608 ,R/TP ,; , ,[empty] [empty] , ,-55TO+125C , ,[empty] ,[empty] ,[empty] ,[empty]		
6	C319	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C32	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C320	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C321	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C33	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C34	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C35	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C36	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C37	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C38	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C39	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C4	CAP,CHIP,MAKER	ECZH0000822	1.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C40	CAP,CERAMIC,CHIP	ECCH0000393	22 uF,6.3V ,M ,X5R ,HD ,2012 ,R/TP		
6	C400	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C401	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C402	CAP,TANTAL,CHIP	ECTH0005501	33 uF,10V ,M ,L_ESR ,2012 ,R/TP ,; , ,[empty] ,[empty] , ,-55TO+125C , ,[empty] ,[empty] ,[empty] ,[empty]		
6	C403	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C404	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C405	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C406	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C407	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C408	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C409	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C41	CAP,CERAMIC,CHIP	ECCH0005604	10 uF,6.3V ,M ,X5R ,TC ,1608 ,R/TP		
6	C410	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C411	CAP,CERAMIC,CHIP	ECCH0007802	4.7 uF,10V ,M ,X5R ,TC ,1608 ,R/TP		
6	C412	CAP,CERAMIC,CHIP	ECCH0007802	4.7 uF,10V ,M ,X5R ,TC ,1608 ,R/TP		
6	C413	CAP,CERAMIC,CHIP	ECCH0007802	4.7 uF,10V ,M ,X5R ,TC ,1608 ,R/TP		
6	C414	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C415	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C417	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C418	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C419	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C42	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C420	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C421	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C422	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C423	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C424	CAP,CERAMIC,CHIP	ECCH0007802	4.7 uF,10V ,M ,X5R ,TC ,1608 ,R/TP		
6	C425	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C426	CAP,CERAMIC,CHIP	ECCH0007802	4.7 uF,10V ,M ,X5R ,TC ,1608 ,R/TP		
6	C427	CAP,CERAMIC,CHIP	ECCH0007802	4.7 uF,10V ,M ,X5R ,TC ,1608 ,R/TP		
6	C428	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C429	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C43	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C430	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C431	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C432	CAP,CERAMIC,CHIP	ECCH0000393	22 uF,6.3V ,M ,X5R ,HD ,2012 ,R/TP		
6	C433	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C434	CAP,CERAMIC,CHIP	ECCH0007802	4.7 uF,10V ,M ,X5R ,TC ,1608 ,R/TP		
6	C435	CAP,CERAMIC,CHIP	ECCH0007802	4.7 uF,10V ,M ,X5R ,TC ,1608 ,R/TP		
6	C436	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C437	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C438	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C44	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C45	CAP,CHIP,MAKER	ECZH0000844	68 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C46	CAP,CHIP,MAKER	ECZH0000843	62 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C47	CAP,TANTAL,CHIP	ECTH0005101	2.2 uF,10V ,M ,STD ,1608 ,R/TP		
6	C48	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C49	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C5	CAP,CERAMIC,CHIP	ECCH0000107	6 pF,50V,D,NP0,TC,1005,R/TP		
6	C50	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C500	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C501	CAP,TANTAL,CHIP	ECTH0004807	10 uF,10V ,M ,STD ,1608 ,R/TP ,; , ,[empty] ,[empty] , ,-55TO+125C , ,[empty] ,[empty] ,[empty] ,[empty]		
6	C503	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C504	CAP,TANTAL,CHIP	ECTH0005202	100 uF,4V ,M ,L_ESR ,2012 ,R/TP ,; , ,[empty] ,[empty] , ,[empty] , ,[empty] ,[empty] ,[empty] ,[empty]		
6	C505	CAP,TANTAL,CHIP	ECTH0005202	100 uF,4V ,M ,L_ESR ,2012 ,R/TP ,; , ,[empty] ,[empty] , ,[empty] , ,[empty] ,[empty] ,[empty] ,[empty]		
6	C506	CAP,CERAMIC,CHIP	ECCH0002002	47000 pF,10V ,K ,B ,HD ,1005 ,R/TP		
6	C507	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C508	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C509	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C51	CAP,CHIP,MAKER	ECZH0000841	56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C510	CAP,TANTAL,CHIP	ECTH0003701	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
6	C511	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C512	CAP,TANTAL,CHIP	ECTH0005501	33 uF,10V ,M ,L_ESR ,2012 ,R/TP ,; , ,[empty] ,[empty] , ,-55TO+125C , ,[empty] ,[empty] ,[empty] ,[empty]		
6	C513	CAP,CHIP,MAKER	ECZH0003121	68 nF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C514	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C515	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C516	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C517	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C518	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C519	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C52	CAP,CERAMIC,CHIP	ECCH0001001	6.8 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C520	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C521	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C522	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C524	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C525	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C526	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C53	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C54	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C55	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C56	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C57	CAP,CHIP,MAKER	ECZH0001002	0.5 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C58	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C59	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C6	CAP,CERAMIC,CHIP	ECCH0000107	6 pF,50V,D,NP0,TC,1005,R/TP		
6	C60	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C602	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C603	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C604	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C605	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C606	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C607	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C608	CAP,CHIP,MAKER	ECZH0003124	68 nF,16V ,K ,X7R ,HD ,1005 ,R/TP		
6	C609	CAP,CHIP,MAKER	ECZH0000822	1.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C61	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C62	CAP,CERAMIC,CHIP	ECCH0000175	2.7 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C63	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C65	CAP,CHIP,MAKER	ECZH0000846	8.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C66	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C67	CAP,CHIP,MAKER	ECZH0001002	0.5 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C69	INDUCTOR,CHIP	ELCH0004718	5.6 nH,S ,1005 ,R/TP ,		
6	C7	CAP,CERAMIC,CHIP	ECCH0001002	180 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C70	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C71	CAP,CHIP,MAKER	ECZH0001002	0.5 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C72	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C73	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C74	CAP,CERAMIC,CHIP	ECCH0000105	4 pF,50V,C,NP0,TC,1005,R/TP		
6	C76	CAP,CERAMIC,CHIP	ECCH0000105	4 pF,50V,C,NP0,TC,1005,R/TP		
6	C77	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C79	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C8	CAP,CHIP,MAKER	ECZH0000841	56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C80	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C81	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C82	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C83	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C84	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C85	CAP,CERAMIC,CHIP	ECCH0000127	82 pF,50V,J,NP0,TC,1005,R/TP		
6	C86	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C88	CAP,FILM,MPP	ECFD0000105	2.2 nF,16V ,J ,STD ,SMD ,1608 mm,R/TP ,; , ,5% ,[empty] ,[empty] ,-55TO+125C ,[empty] ,1.6X0.8X0.7MM ,R/TP		
6	C89	CAP,CERAMIC,CHIP	ECCH0000187	150 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C9	CAP,CHIP,MAKER	ECZH0000806	5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C90	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C91	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C93	CAP,CERAMIC,CHIP	ECCH0000183	1.8 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C94	CAP,CHIP,MAKER	ECZH0000846	8.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C95	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C97	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C99	CAP,CERAMIC,CHIP	ECCH0000183	1.8 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	CN300	CONNECTOR,BOARD TO BOARD	ENBY0018501	10 PIN,.4 mm,STRAIGHT , ,H=0.9,HEADER		
6	CN500	CONNECTOR,BOARD TO BOARD	ENBY0036701	60 PIN,0.4 mm,ETC , ,H=1.0, Plug		
6	CN501	CONNECTOR,I/O	ENRY0006801	18 PIN,0.4 mm,ETC , , ,; ,18 ,0.40MM ,ANGLE ,RECEPTACLE ,SMD ,R/TP ,		
6	CN503	CONN,SOCKET	ENSY0017001	6 PIN,ETC , ,2.54 mm,H=1.4		
6	D400	DIODE,SWITCHING	EDSY0011901	EMD2 ,30 V,1 A,R/TP ,VF=1.5V(IF=200mA) , IR=30uA(VR=10V)		
6	D500	DIODE,TVS	EDTY0008607	SC70-6L ,6 V,200 W,R/TP ,PB-FREE		
6	D501	DIODE,TVS	EDTY0009401	VMN2 ,5 V,10 W,R/TP ,1.0*0.6*0.4 ,; , ,7.82V , , ,100mW ,[empty] ,[empty] ,2P ,1		
6	D502	DIODE,SWITCHING	EDSY0011901	EMD2 ,30 V,1 A,R/TP ,VF=1.5V(IF=200mA) , IR=30uA(VR=10V)		
6	D503	DIODE,TVS	EDTY0007501	SOD-523 ,5 V,240 W,R/TP ,Vc 12.5V , 160pF , 1.6*0.8*.06		
6	D504	DIODE,TVS	EDTY0009401	VMN2 ,5 V,10 W,R/TP ,1.0*0.6*0.4 ,; , ,7.82V , , ,100mW ,[empty] ,[empty] ,2P ,1		
6	D505	DIODE,TVS	EDTY0009401	VMN2 ,5 V,10 W,R/TP ,1.0*0.6*0.4 ,; , ,7.82V , , ,100mW ,[empty] ,[empty] ,2P ,1		
6	D506	DIODE,TVS	EDTY0009401	VMN2 ,5 V,10 W,R/TP ,1.0*0.6*0.4 ,; , ,7.82V , , ,100mW ,[empty] ,[empty] ,2P ,1		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	D507	DIODE,TVS	EDTY0008601	SOD-323 ,6 V,400 W,R/TP ,PB-FREE		
6	D508	DIODE,TVS	EDTY0007401	SMD ,12 V,350 W,R/TP ,		
6	D600	DIODE,SWITCHING	EDSY0011901	EMD2 ,30 V,1 A,R/TP ,VF=1.5V(IF=200mA) , IR=30uA(VR=10V)		
6	FB300	FILTER,BEAD,CHIP	SFBH0009801	600 ohm,1005 ,DC Res.0.6ohm, R.C.500mA		
6	FB301	FILTER,BEAD,CHIP	SFBH0009801	600 ohm,1005 ,DC Res.0.6ohm, R.C.500mA		
6	FB500	FILTER,BEAD,CHIP	SFBH0009801	600 ohm,1005 ,DC Res.0.6ohm, R.C.500mA		
6	FB501	FILTER,BEAD,CHIP	SFBH0000909	60 ohm,1005 ,		
6	FL100	FILTER,SEPERATOR	SFAY0008502	850.900.1800 ,1900.2100 , dB, dB, dB, dB,ETC ,Quad GSM, Triple WCDMA with 4 Rx SAW Filter, 5.4x5.0x1.2		
6	FL101	FILTER,SAW,DUAL	SFSB0000601	836.5 MHz,25 MHz,4.4 dB,17 dB,897.5 MHz,35 MHz,4.4 dB,10 dB,3.2*2.5*1.5 ,SMD ,Pb-free_Tx Dual SAW & Switch Module		
6	FL102	DUPLEXER,DCN	SDDY0004101	836.5 MHz,881.5 MHz,2.0 dB,2.7 dB,49 dB,61 dB,3.0*2.5*1.25 ,SMD ,		
6	FL103	FILTER,SAW,DUAL	SFSB0001601	836.5 MHz,25 MHz,2.2 dB,40 dB,1880 MHz,58.75 MHz,4 dB,30 dB,2.0*1.6*0.68 ,SMD ,824M~849M,1850.625M~1909.375M,10p,B,50,50,DCN+ USPCS Tx,BIDIR ,; ,836.5, 1880 ,2.0*1.6*0.68 ,SMD ,R/TP		
6	FL104	DUPLEXER,PCS	SDPY0002902	1880 MHz,1960 MHz,3.8 dB,3.5 dB,43 dB,52 dB,3.8*3.8*1.4 ,SMD ,FBAR		
6	FL105	FILTER,SAW	SFSY0018201	881.5 MHz,2.0*1.4*0.78 ,SMD ,		
6	FL106	FILTER,SAW	SFSY0024901	1960 MHz,2.0*1.4*0.68 ,SMD ,5pin, Unbal-Bal, 50/100, B7834 Low Loss ver.		
6	FL500	FILTER,EMI/POWER	SFEY0010501	SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free		
6	FL501	FILTER,EMI/POWER	SFEY0010501	SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free		
6	FL502	FILTER,EMI/POWER	SFEY0010501	SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free		
6	FL503	FILTER,EMI/POWER	SFEY0010501	SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free		
6	FL504	FILTER,EMI/POWER	SFEY0010501	SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free		
6	FL505	FILTER,EMI/POWER	SFEY0010501	SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free		
6	FL506	FILTER,EMI/POWER	SFEY0010501	SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free		
6	FL507	FILTER,EMI/POWER	SFEY0010501	SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free		
6	L100	INDUCTOR,CHIP	ELCH0003814	5.1 nH,S ,1005 ,R/TP ,5.1nH,1005		
6	L102	CAP,CHIP,MAKER	ECZH0000822	1.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	L103	INDUCTOR,CHIP	ELCH0003825	56 nH,J ,1005 ,R/TP ,chip inductor,PBFREE		
6	L104	INDUCTOR,CHIP	ELCH0001041	10 nH,S ,1005 ,R/TP ,PBFREE		
6	L105	INDUCTOR,CHIP	ELCH0003814	5.1 nH,S ,1005 ,R/TP ,5.1nH,1005		
6	L106	INDUCTOR,CHIP	ELCH0004733	4.3 nH,S ,1005 ,R/TP ,Coil		
6	L107	INDUCTOR,CHIP	ELCH0004720	1.2 nH,S ,1005 ,R/TP ,		
6	L108	INDUCTOR,CHIP	ELCH0005012	3.9 nH,S ,1005 ,R/TP ,		
6	L110	INDUCTOR,CHIP	ELCH0001401	15 nH,J ,1005 ,R/TP ,Pb Free		
6	L111	INDUCTOR,CHIP	ELCH0004733	4.3 nH,S ,1005 ,R/TP ,Coil		
6	L112	INDUCTOR,CHIP	ELCH0001413	22 nH,J ,1005 ,R/TP ,PBFREE		
6	L114	INDUCTOR,CHIP	ELCH0001413	22 nH,J ,1005 ,R/TP ,PBFREE		
6	L115	INDUCTOR,CHIP	ELCH0005813	27 nH,J ,1005 ,R/TP ,		
6	L116	INDUCTOR,CHIP	ELCH0001421	47 nH,J ,1005 ,R/TP ,PBFREE		
6	L117	INDUCTOR,CHIP	ELCH0005813	27 nH,J ,1005 ,R/TP ,		
6	L118	INDUCTOR,CHIP	ELCH0003826	3.3 nH,S ,1005 ,R/TP ,chip		
6	L119	INDUCTOR,CHIP	ELCH0001421	47 nH,J ,1005 ,R/TP ,PBFREE		
6	L120	INDUCTOR,CHIP	ELCH0001401	15 nH,J ,1005 ,R/TP ,Pb Free		
6	L121	INDUCTOR,CHIP	ELCH0004701	12 nH,J ,1005 ,R/TP ,		
6	L122	INDUCTOR,CHIP	ELCH0001034	3.3 nH,S ,1005 ,R/TP ,PBFREE		
6	L123	INDUCTOR,CHIP	ELCH0001009	1.2 nH,S ,1005 ,R/TP ,		
6	L124	INDUCTOR,CHIP	ELCH0001403	1 nH,S ,1005 ,R/TP ,PBFREE		
6	L125	INDUCTOR,CHIP	ELCH0001420	3.9 nH,S ,1005 ,R/TP ,PBFREE		
6	L126	INDUCTOR,CHIP	ELCH0004704	4.7 nH,S ,1005 ,R/TP ,		
6	L128	CAP,CERAMIC,CHIP	ECCH0000127	82 pF,50V,J,NP0,TC,1005,R/TP		
6	L129	INDUCTOR,CHIP	ELCH0001009	1.2 nH,S ,1005 ,R/TP ,		
6	L131	INDUCTOR,CHIP	ELCH0004705	8.2 nH,J ,1005 ,R/TP ,		
6	L132	INDUCTOR,CHIP	ELCH0001031	15 nH,J ,1005 ,R/TP ,PBFREE		
6	L133	INDUCTOR,CHIP	ELCH0005006	33 nH,J ,1005 ,R/TP ,		
6	L135	INDUCTOR,CHIP	ELCH0001031	15 nH,J ,1005 ,R/TP ,PBFREE		
6	L136	INDUCTOR,CHIP	ELCH0001009	1.2 nH,S ,1005 ,R/TP ,		
6	L137	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	L138	INDUCTOR,CHIP	ELCH0001421	47 nH,J ,1005 ,R/TP ,PBFREE		
6	L139	INDUCTOR,CHIP	ELCH0004716	39 nH,J ,1005 ,R/TP ,		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	L140	INDUCTOR,CHIP	ELCH0005803	2.7 nH,S ,1005 ,R/TP ,		
6	L141	INDUCTOR,CHIP	ELCH0001420	3.9 nH,S ,1005 ,R/TP ,PBFREE		
6	L142	INDUCTOR,CHIP	ELCH0004716	39 nH,J ,1005 ,R/TP ,		
6	L143	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	L400	INDUCTOR,SMD,POWER	ELCP0008004	4.7 uH,M ,1 ,R/TP , ,; , ,0.3NH , , , , , ,NON SHIELD ,2.5X2X1MM ,11MM ,R/TP		
6	L401	INDUCTOR,SMD,POWER	ELCP0008004	4.7 uH,M ,1 ,R/TP , ,; , ,0.3NH , , , , , ,NON SHIELD ,2.5X2X1MM ,11MM ,R/TP		
6	L402	INDUCTOR,SMD,POWER	ELCP0008004	4.7 uH,M ,1 ,R/TP , ,; , ,0.3NH , , , , , ,NON SHIELD ,2.5X2X1MM ,11MM ,R/TP		
6	L500	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	M100	MODULE,ETC	SMZY0012601	4.5x3.2x1.2 Bluetooth RF Module		
6	MIC300	MICROPHONE	SUMY0010602	UNIT ,-42 dB,6.15*3.76*1.25 ,Silicon mic , ,-42 ,300 ,OMNI ,[empty] ,6.15*3.76*1.25 ,SMD		
6	R100	INDUCTOR,CHIP	ELCH0001034	3.3 nH,S ,1005 ,R/TP ,PBFREE		
6	R103	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R104	INDUCTOR,CHIP	ELCH0001033	1.5 nH,S ,1005 ,R/TP ,PBFREE		
6	R105	RES,CHIP,MAKER	ERHZ0000212	12 Kohm,1/16W ,F ,1005 ,R/TP		
6	R106	RES,CHIP,MAKER	ERHZ0000310	680 ohm,1/16W ,F ,1005 ,R/TP		
6	R107	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R108	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R109	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R110	RES,CHIP,MAKER	ERHZ0003801	5.1 ohm,1/16W ,J ,1005 ,R/TP		
6	R112	RES,CHIP	ERHY0013101	2.7 ohm,1/16W ,J ,1005 ,R/TP		
6	R113	RES,CHIP,MAKER	ERHZ0000500	62 ohm,1/16W ,J ,1005 ,R/TP		
6	R114	RES,CHIP,MAKER	ERHZ0000206	10 ohm,1/16W ,F ,1005 ,R/TP		
6	R115	RES,CHIP,MAKER	ERHZ0000201	100 ohm,1/16W ,F ,1005 ,R/TP		
6	R116	RES,CHIP,MAKER	ERHZ0000201	100 ohm,1/16W ,F ,1005 ,R/TP		
6	R118	RES,CHIP,MAKER	ERHZ0000495	56 ohm,1/16W ,J ,1005 ,R/TP		
6	R119	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R120	RES,CHIP,MAKER	ERHZ0000411	120 ohm,1/16W ,J ,1005 ,R/TP		
6	R121	RES,CHIP,MAKER	ERHZ0000411	120 ohm,1/16W ,J ,1005 ,R/TP		
6	R122	RES,CHIP,MAKER	ERHZ0000527	200 ohm,1/6W ,J ,1005 ,R/TP		
6	R123	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	R124	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R125	RES,CHIP,MAKER	ERHZ0000495	56 ohm,1/16W ,J ,1005 ,R/TP		
6	R126	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R127	RES,CHIP,MAKER	ERHZ0000408	110 ohm,1/16W ,J ,1005 ,R/TP		
6	R128	RES,CHIP,MAKER	ERHZ0000408	110 ohm,1/16W ,J ,1005 ,R/TP		
6	R129	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R130	RES,CHIP,MAKER	ERHZ0000529	1.5 Kohm,1/16W ,J ,1005 ,R/TP		
6	R131	RES,CHIP,MAKER	ERHZ0000203	10 Kohm,1/16W ,F ,1005 ,R/TP		
6	R132	RES,CHIP,MAKER	ERHZ0000351	11800 ohm,1/16W ,F ,1005 ,R/TP		
6	R133	RES,CHIP	ERHY0005902	5.62 Kohm,1/16W ,F ,1005 ,R/TP		
6	R135	RES,CHIP,MAKER	ERHZ0000326	330 ohm,1/16W ,F ,1005 ,R/TP		
6	R136	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R137	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R200	RES,CHIP,MAKER	ERHZ0000537	680000 ohm,1/16W ,F ,1005 ,R/TP		
6	R201	RES,CHIP,MAKER	ERHZ0000222	150 Kohm,1/16W ,F ,1005 ,R/TP		
6	R202	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R203	RES,CHIP,MAKER	ERHZ0000500	62 ohm,1/16W ,J ,1005 ,R/TP		
6	R205	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R206	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R207	RES,CHIP,MAKER	ERHZ0000203	10 Kohm,1/16W ,F ,1005 ,R/TP		
6	R208	RES,CHIP,MAKER	ERHZ0000236	2000 ohm,1/16W ,F ,1005 ,R/TP		
6	R209	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R210	RES,CHIP,MAKER	ERHZ0000243	2200 ohm,1/16W ,F ,1005 ,R/TP		
6	R211	RES,CHIP,MAKER	ERHZ0000243	2200 ohm,1/16W ,F ,1005 ,R/TP		
6	R300	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R301	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R302	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R303	RES,CHIP,MAKER	ERHZ0000308	62 Kohm,1/16W ,F ,1005 ,R/TP		
6	R304	RES,CHIP,MAKER	ERHZ0000308	62 Kohm,1/16W ,F ,1005 ,R/TP		
6	R305	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R404	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R405	RES,CHIP,MAKER	ERHZ0004201	121000 ohm,1/16W ,F ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	R406	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R408	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R409	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R411	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R412	RES,CHIP,MAKER	ERHZ0000287	47 Kohm,1/16W ,F ,1005 ,R/TP		
6	R413	RES,CHIP,MAKER	ERHZ0004301	0.1 ohm,1/4W ,F ,ETC ,R/TP		
6	R500	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R503	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R504	RES,CHIP	ERHY0000105	51 ohm,1/16W,F,1005,R/TP		
6	R505	RES,CHIP	ERHY0000105	51 ohm,1/16W,F,1005,R/TP		
6	R506	RES,CHIP,MAKER	ERHZ0000288	470 Kohm,1/16W ,F ,1005 ,R/TP		
6	R508	RES,CHIP,MAKER	ERHZ0000537	680000 ohm,1/16W ,F ,1005 ,R/TP		
6	R509	RES,CHIP,MAKER	ERHZ0000318	80.6 Kohm,1/16W ,F ,1005 ,R/TP		
6	R510	RES,CHIP,MAKER	ERHZ0000288	470 Kohm,1/16W ,F ,1005 ,R/TP		
6	R511	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R512	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R513	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R514	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R515	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R516	RES,CHIP,MAKER	ERHZ0000422	15 Kohm,1/16W ,J ,1005 ,R/TP		
6	R517	RES,CHIP,MAKER	ERHZ0000487	470 Kohm,1/16W ,J ,1005 ,R/TP		
6	R602	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R619	RES,CHIP,MAKER	ERHZ0000407	1000 Kohm,1/16W ,J ,1005 ,R/TP		
6	R620	RES,CHIP,MAKER	ERHZ0000488	4.7 ohm,1/16W ,J ,1005 ,R/TP		
6	R621	RES,CHIP,MAKER	ERHZ0000488	4.7 ohm,1/16W ,J ,1005 ,R/TP		
6	R622	RES,CHIP,MAKER	ERHZ0000435	20 ohm,1/16W ,J ,1005 ,R/TP		
6	R624	RES,CHIP,MAKER	ERHZ0000451	27 ohm,1/16W ,J ,1005 ,R/TP		
6	RA600	RES,ARRAY,R	ERNR0000404	100 Kohm,100 Kohm,8 PIN,J ,1/16W ,SMD ,R/TP		
6	S500	CONN,SOCKET	ENSY0018801	8 PIN,ETC , ,2.54 mm,Micro-SD Socket, Normal		
6	SPK	CONN,RECEPTACLE	ENEY0003801	2 PIN, , ,		
6	SW100	CONN,RF SWITCH	ENWY0004401	,SMD , dB,H=2.2		
6	U101	PAM	SMPY0013501	35 dBm,51 %, A, dBc, dB,7x7x1.1 ,SMD ,Polar Edge		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	U102	COUPLER,RF DIRECTIONAL	SCDY0003901	19.8 dB,0.28 dB,33 dB,1.0*0.5*0.4 ,SMD ,Pb-free_Coupler_DCN Tx ,; ,[empty] ,836.5MHz ,25MHz ,SMD ,R/TP		
6	U103	IC	EUSY0278501	SON5-P-0.50 ,5 PIN,R/TP ,INVERTER GATE, Pb Free		
6	U104	COUPLER,RF DIRECTIONAL	SCDY0003801	20.5 dB,0.25 dB,34 dB,1.0*0.5*0.4 ,SMD ,Pb-free_Coupler_USPCS Tx ,; ,[empty] ,1880MHz ,60MHz ,SMD ,R/TP		
6	U105	PAM	SMPY0015801	28 dBm,39 %, A, dBc, dB,3x5x1 ,SMD ,HELP3 Dual PAM ;; , , , , , , , ,R/TP ,R/TP ,14		
6	U106	IC	EUSY0300401	QFN ,48 PIN,R/TP ,WCDMA Dual Receiver IC for USA, 7X7X0.9		
6	U200	IC	EUSY0334501	CSP ,409 PIN,R/TP ,HSDPA3.6Mbps Baseband		
6	U300	IC	EUSY0160001	MicroStar Junior ,15 PIN,R/TP ,1.1W Class-D Mono Audio AMP		
6	U301	IC	EUSY0336901	FBGA ,225 PIN,ETC ,1G(LB/128Mx16/2.7V) NAND+512(16Mx32) SDRAM , ,IC,MCP		
6	U400	IC	EUSY0238702	TSOPJW-12 ,12 PIN,R/TP ,3PORT Charge Pump(AAT2154 Low cost version)		
6	U401	IC	EUSY0347301	BCCS ,84 PIN,R/TP ,PA buck --> General Buck (for RF CMOS Chip) ,; ,IC,PMIC		
6	U402	IC	EUSY0332901	WDFN ,8 PIN,R/TP ,-12V, 6.3A, Single P-MOSFET & DUAL Transistor		
6	U501	IC	EUSY0333701	TLLGA ,8 PIN,R/TP ,OVP		
6	U502	FILTER,EMI/POWER	SFEY0006501	SMD ,3 TERMINAL EMI FILTER		
6	U601	IC	EUSY0300502	QFN ,56 PIN,R/TP ,chartered,GSM, WCDMA Single RF Transceiver, 8X8X0.9 ,; ,IC,Tx/Rx		
6	VA502	DIODE,TVS	EDTY0009101	SOD-923 ,5 V,150 mW,R/TP ,1.0*0.6*0.4		
6	VA503	DIODE,TVS	EDTY0009101	SOD-923 ,5 V,150 mW,R/TP ,1.0*0.6*0.4		
6	VA505	VARISTOR	SEVY0003801	18 V, ,SMD ,		
6	VA506	VARISTOR	SEVY0003801	18 V, ,SMD ,		
6	VA507	VARISTOR	SEVY0003801	18 V, ,SMD ,		
6	VA508	VARISTOR	SEVY0003801	18 V, ,SMD ,		
6	VA509	VARISTOR	SEVY0003801	18 V, ,SMD ,		
6	VA513	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA601	VARISTOR	SEVY0003801	18 V, ,SMD ,		
6	VA602	VARISTOR	SEVY0003801	18 V, ,SMD ,		
6	X100	VCTCXO	EXSK0007802	19.2 MHz,1.5 PPM,10 pF,SMD ,3.3*2.5*1.0 , ,; , ,2PPM ,2.8V , , , , ,SMD ,P/TP		
6	X400	X-TAL	EXXY0016601	32.768 KHz,20 PPM,9 pF,65 Kohm,SMD ,4.9*1.8*0.9 ,		

Level	Location No.	Description	Part Number	Spec	Color	Remark
5	SAFD00	PCB ASSY, MAIN,SMT TOP	SAFD0090301	CU420 ATTGR		
6	C600	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C601	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	LD600	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	LD601	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	LD602	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	LD603	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	LD604	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	LD605	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	LD606	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	LD607	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	LD608	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	LD609	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	LD610	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	LD611	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	LD612	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	LD613	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	LD614	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	LD615	DIODE,LED,CHIP	EDLH0012902	SNOWWHITE ,1608 ,R/TP , ,; ,[empty] ,2.85~3.25 ,5mA , , ,65mW ,[empty] ,[empty] ,2P		
6	PCB	PCB,MAIN	SPFY0151201	FR-4 ,0.8 mm,STAGGERED-8 , ,; , , , , , , , , ,		
6	R600	RES,CHIP,MAKER	ERHZ0000500	62 ohm,1/16W ,J ,1005 ,R/TP		
6	R601	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R603	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R604	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	R605	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R606	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R607	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R608	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R609	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R610	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R611	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R612	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R613	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R614	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R615	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R616	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R617	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R618	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	U600	IC	EUSY0129503	2x2 mm MLPD ,3 PIN,R/TP ,Hall Effect Switch, Pb Free		
6	VA600	VARISTOR	SEVY0003801	18 V, ,SMD ,		
6	VA603	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA604	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA605	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA606	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA607	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA608	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA609	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA610	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA611	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA612	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA613	VARISTOR	SEVY0000701	14 V, ,SMD ,120pF, 1005		

11. EXPLODED VIEW & REPLACEMENT PART LIST

11.3 Accessory

Level	Location No.	Description	Part Number	Spec	Color	Remark
3	SBPL00	BATTERY PACK,LI-ION	SBPL0086901	3.7 V,1000 mAh,1 CELL,PRISMATIC ,553446 INNERPACK, STD ,; , , , , ,PRISMATIC , , ,BLACK , ,	Black	85,S
3	SSAD00	ADAPTOR,AC-DC	SSAD0024401	100-240V ,5060 Hz,5.1 V,.7 A,UL/CSA ,AC-DC ADAPTOR ,; ,85Vac ~ 264Vac ,5.1V +0.15, -0.2V ,700mA ,5060 , ,WALL 2P ,I/O CONNECTOR ,		
		ADAPTOR,AC-DC	SSAD0024402	100-240V ,5060 Hz,5.1 V,0.7 A,UL/CSA ,AD-DC ADAPTOR ,; ,85Vac~264Vac ,5.1 +0.15, -0.2V ,700mA ,5060 , ,WALL 2P ,I/O CONNECTOR ,		
		ADAPTOR,AC-DC	SSAD0024403	100-240V ,5060 Hz,5.1 V,.7 A,UL/CSA ,AC-DC ADAPTOR ,; ,85Vac~264Vac ,5.1V (+0.15V, -0.2V) ,700mA ,5060 , ,WALL 2P ,I/O CONNECTOR ,		
		ADAPTOR,AC-DC	SSAD0024404	100-240V ,5060 Hz,5.1 V,.7 A,UL/CSA ,AC-DC ADAPTOR ,; ,85Vac~264Vac ,5.1 (+0.15V, -0.2V) ,700mA ,5060 , ,WALL 2P ,I/O CONNECTOR ,		

Note